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Telephony

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10,786 of Which 10,253 is Paid

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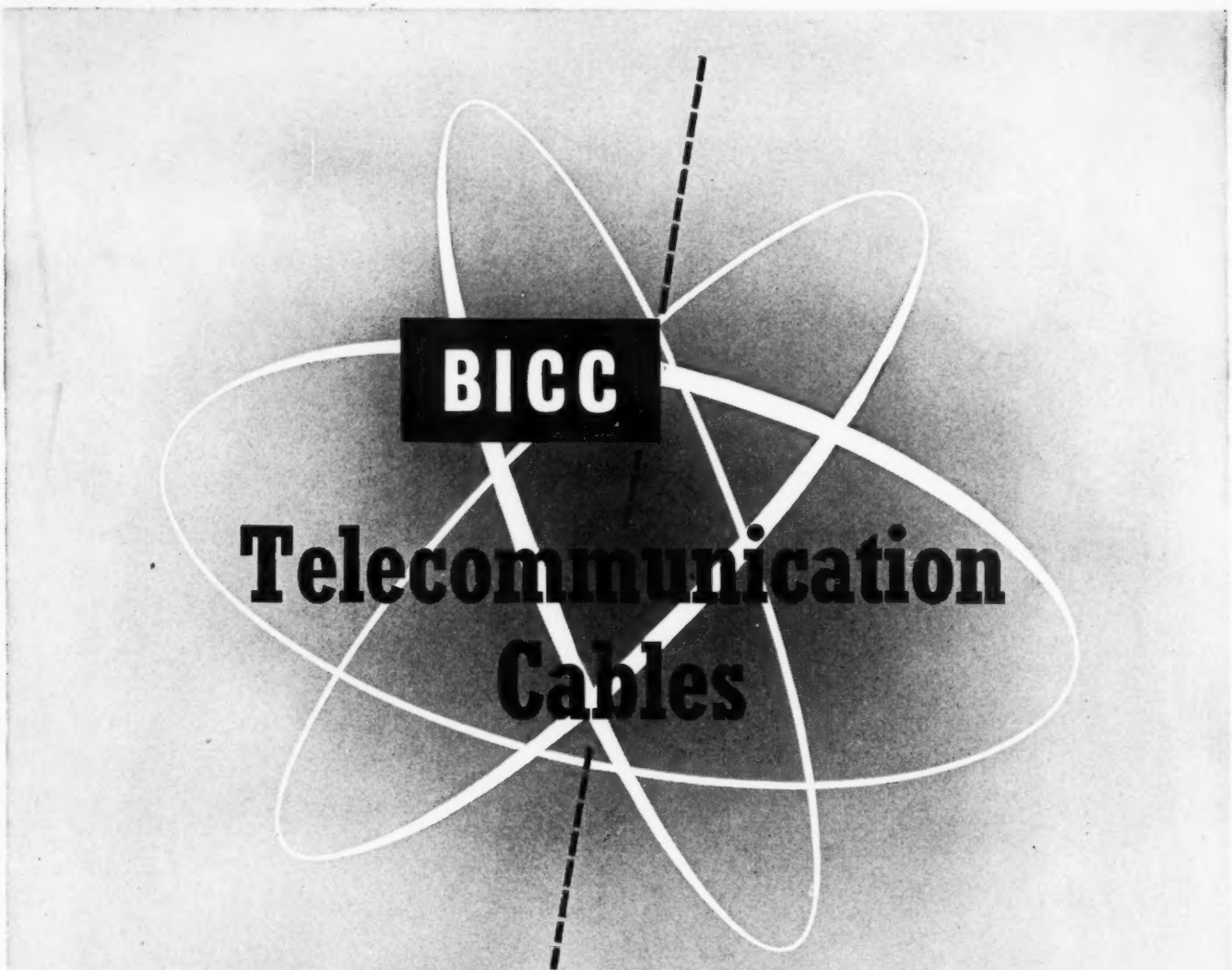

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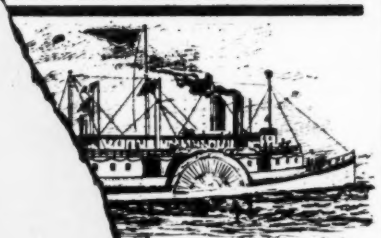

ANNOUNCES NEW RRY SCHEDULES

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335	454	—	610	—	834
	459	—	623	—	841
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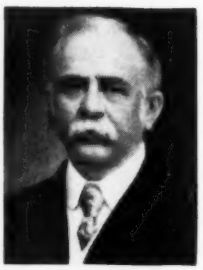
November.

KELLOGG BUILDS WORLD'S LARGEST SWITCHBOARD FOR ST. LOUIS



St. Louis, July 2, 1897—The experts predict that someday the telephone will be as common as the gaslight, and that almost everybody in St. Louis will have one of these new contraptions. A big step was taken recently when the Kenloch Telephone Company engaged the Kellogg Switchboard and Supply Company to build a switchboard for them here. Now nearing completion, this switchboard will be the largest ever manufactured to be housed in one exchange room.

Milo Gifford Kellogg, the manufacturer, is a pioneer in the development of telephone equipment. He has invented many telephone devices. In fact, recently he was granted 125 consecutively numbered patents.

continued on page 2 col. 1

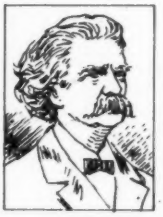
QUEEN VICTORIA TO VISIT COLONIES IN AFRICA

May stop at Bango-Bongo

QUEEN VI

The Queen's vigour and enterprise seem to increase with years. William's exhausting visit was over. She took the train to North Wales and spent were more deputations and more ondon she attended a vast Park. She d

MARK TWAIN SPEAK ON MIS RIVER LORE A LADIES' ANNUA



MARK TWAI many years bef himself as any writer to wh of good fort Sooner or l when in 18 he capitalized a publishing produce his own works, but establishment of someth authorship. It probably ing those years that a celebrity for a g be persuaded to re had come as a ma as a tribute to geniu would be worked o

PROF. PAPPKP'S

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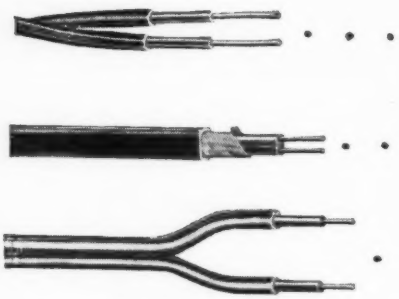

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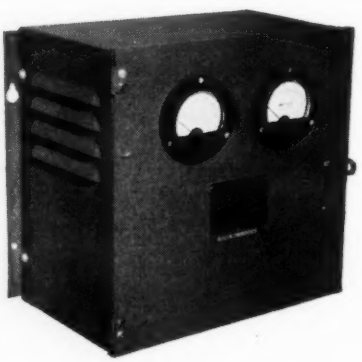

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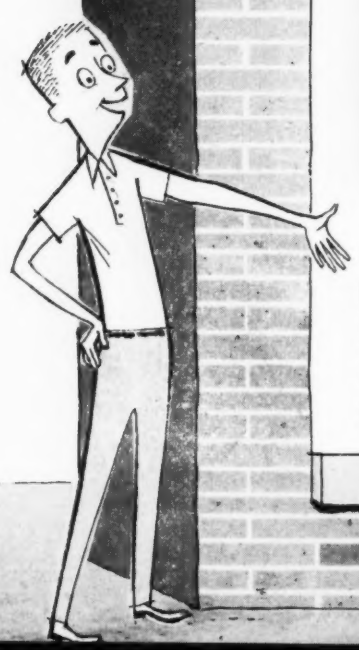

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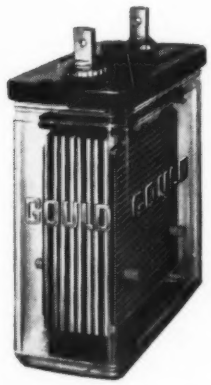

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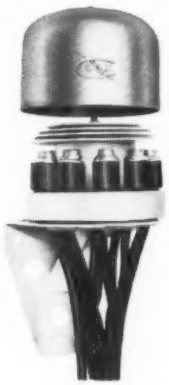

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FLASHES AND PLUGS

THE WORKS. The employes of Somerset Telephone Co., North Anson, Me., had fun and frolic at their Christmas party this year, much of which was occasioned by the awards of merit presented to each member for "boners" pulled during the year. Opportunity was seized, naturally, to present the "raspberry" in all its forms.

Kenton E. Quint, president, was so amused by his citation, he passed the story along to us. The Somerset company has been engaged in an extensive automatic conversion program for the past several years, in the course of which they have borrowed $245,000 from the Chase Manhattan Bank in New York. Mr. Quint, therefore, received a large package from "Mr. Chase," filled with a very large sum of stage money. Pasted on the box cover was this parody on "The Night Before Christmas" in deathless verse:

'Twas the night before Christmas, and all through the bank
Not a greenback was rustling, not a coin dared to clank.
Mr. Chase was nestled all snug in his chair
While visions of interest danced in the air.
When out from the phone there arose such a clatter
He sprang from his seat to see what was the matter.
A telephone manager was filling the air
Asking for money, with pleading and prayer.
He swore not to spend it on blondes, or for joys
But spend it on dial machines, tools for his boys,
He talked fast and long, and he wanted the mint—
Chase knew in a moment, it must be Ken Quint! !
More rapid than eagles, Mr. Chase then arose
The stocks, bonds and dollars he woke from their doze.
He spoke not a word, but went straight to his task,
He filled a large box; took a shot from his flask.
He wrapped up the package, then drove to the train.
Sent millions of dollars to North Anson, Maine.
And I heard him exclaim, as he drove to his home,
"QUINT, YOU'VE GOT THE WHOLE DAMMED BANK
NOW PLEASE LEAVE ME ALONE!!!"

•

UP-AND-COMING LAD. A boy sought a job in a drugstore. The druggist prepared to fill in the application form.

"You're name?"

"Alexander Graham Bell."

"That's a pretty well-known name, isn't it?"

"It ought to be," the boy replied. "I've been delivering groceries around this neighborhood for two years."

•

MONEY TALKS. A Detroit man's traffic ticket was dismissed when he called the traffic referee long distance from Chicago. He explained his car was ticketed for overparking when police requested he stick around as a witness to a traffic accident.

The referee said he was impressed by the sincere sound of the Detroit man dropping quarters into the paystation at the other end of the line.

CIRCULATION

Guaranteed circulation of this issue is 10,786 of which 10,253 is paid.

Telephony

THE JOURNAL OF THE TELEPHONE INDUSTRY
Since 1901

January 14, 1956

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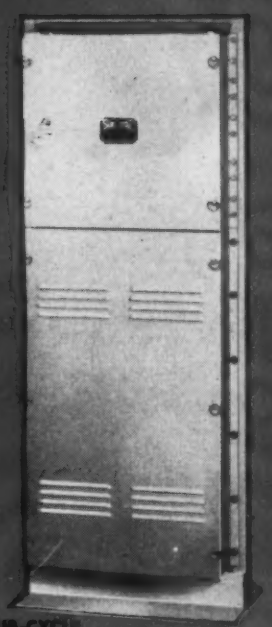

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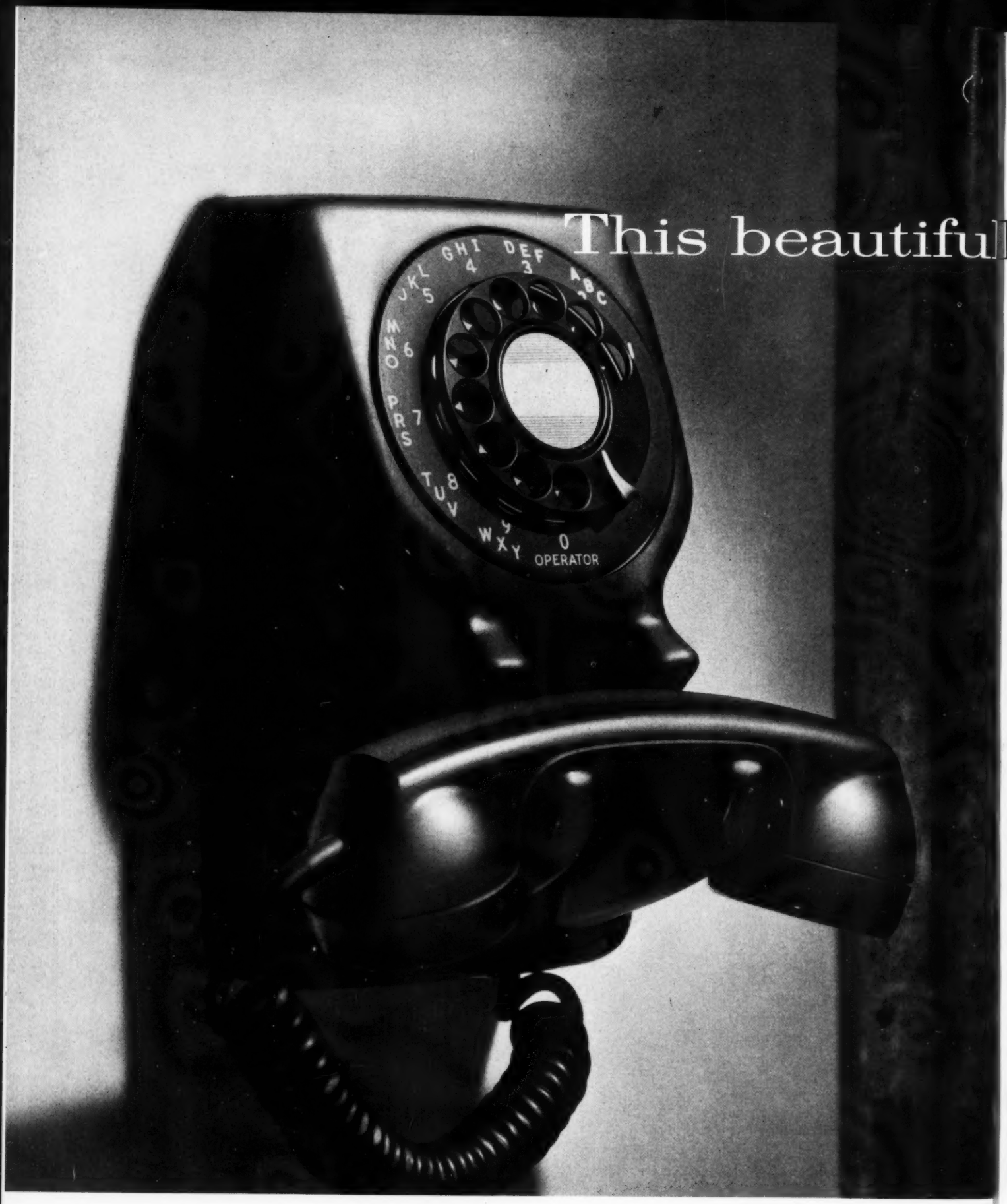

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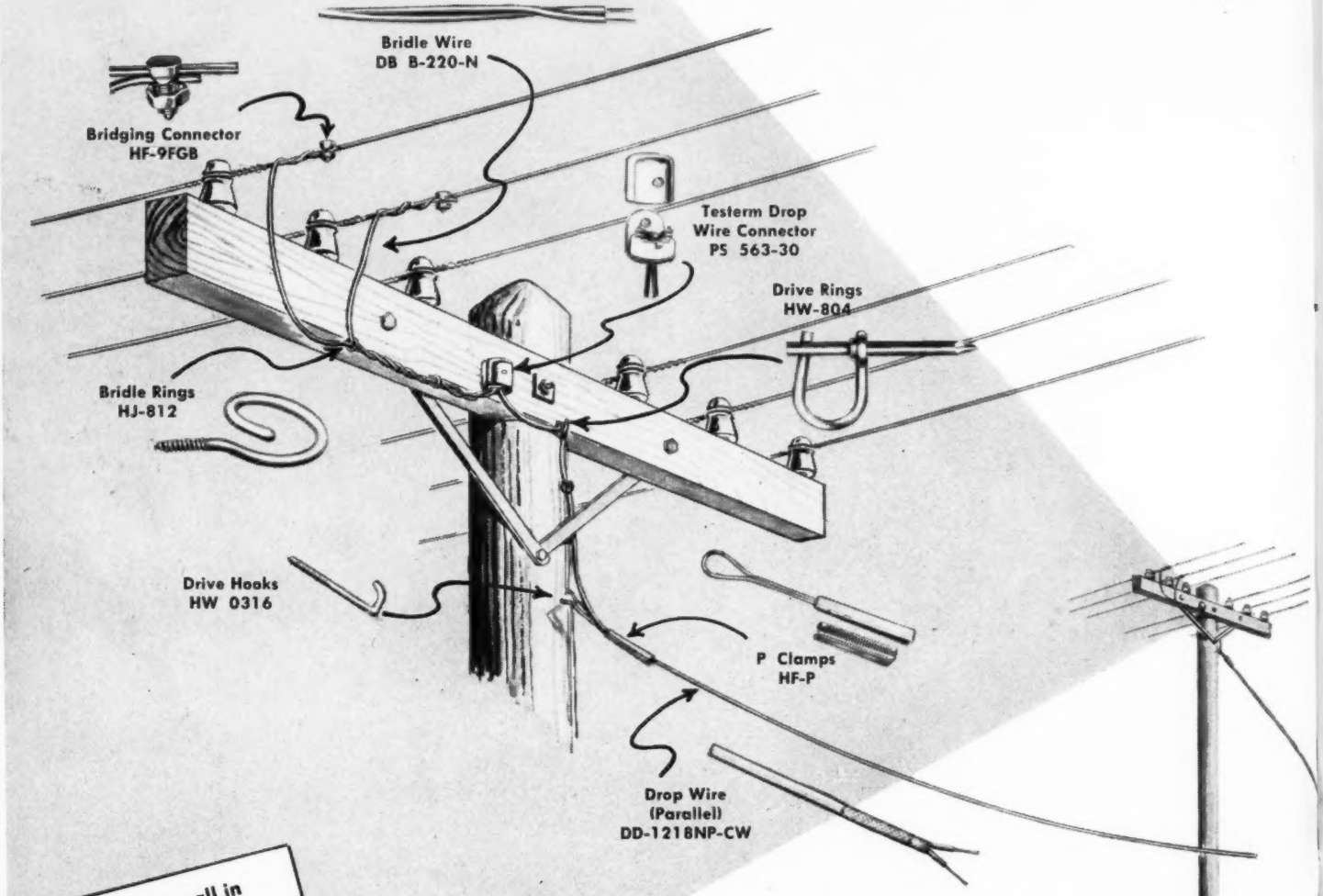
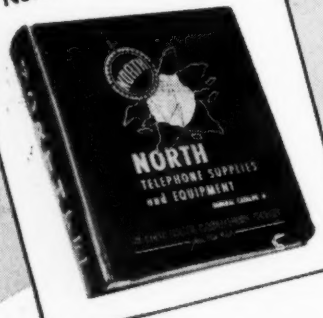


You'll find them all in North's new catalog.



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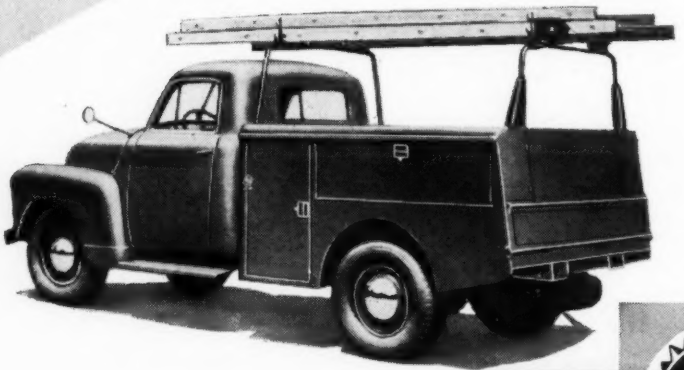

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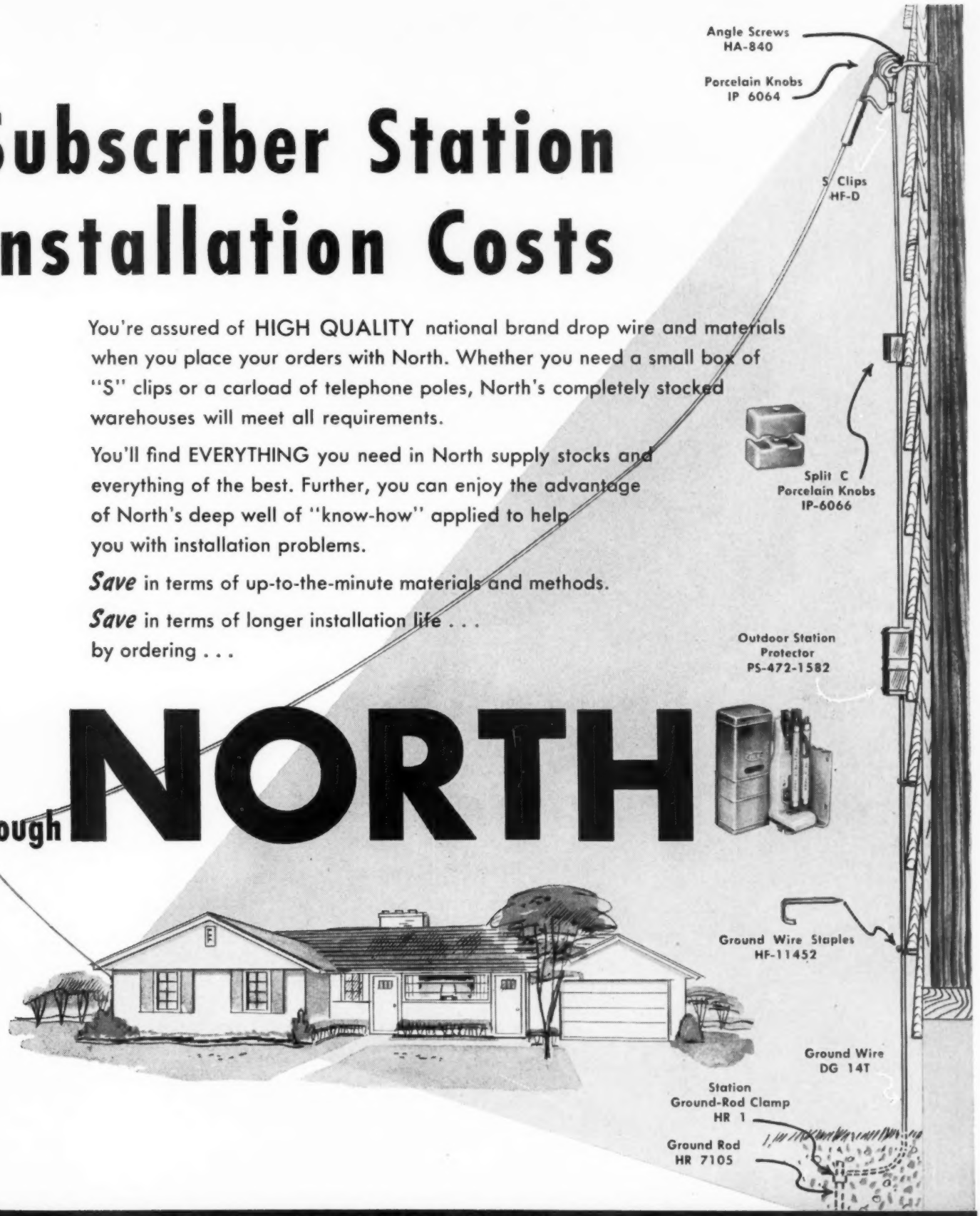

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With many of its islands nearer Turkey than its own mainland Greece was faced with a difficult problem in restoring its communications. Microwave has eliminated the need for relaying cables which were ravaged during the many years of World War II and the Communist-inspired uprisings of the late 1940's.

The Greek Microwave Network

*By HARRY O. COMPTON**

MORE AND MORE Independent telephone companies in the United States are overcoming the so-called "trouble spots" on their lines by turning to PTM microwave radio links because of the ability of microwave to bridge difficult terrain and span wide stretches of water, as well as its effectiveness in the face of extremes in weather. Seldom, however, is a single company confronted with these problems simultaneously as was the Telecommunications Organization of Greece when it began the task of reconstructing and extending that country's telecommunications system.

Early in 1949, the International Telephone & Telegraph Corp. was approached by the Economic Cooperation Administration (ECA) and asked to provide technical information and advice in connection with the rehabilitation and expansion of the telecommunications system of Greece, which had suffered excessive damage during and immediately after World War II. Under terms of a contract, effective July 1 of that year and signed by IT&T and the Greek Government with the approval and financial backing of the ECA, IT&T agreed to send an advisory group to Athens to help carry out the program.

This group returned to the United States following final termination of the contract in April, 1954. At that time, restoration of the Greek telecommunications system had progressed well beyond its prewar level in scope and efficiency, while a solid foundation for future growth had been established.

Prior to ECA entry into the country, telecommunications in Greece were operated by three separate entities. Local telephone service in the principle cities was furnished by the Hellenic Telephone Co. (AETE); long distance and telegraph service throughout the na-

*Mr. Compton is senior advisor to the International Telephone & Telegraph Corp. advisory group in Greece.

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tion and local service in the villages was the function of the Ministry of Posts, Telephones and Telegraphs (PTT); and international telephone and telegraph service was rendered by Cables & Wireless, Ltd., a British organization.

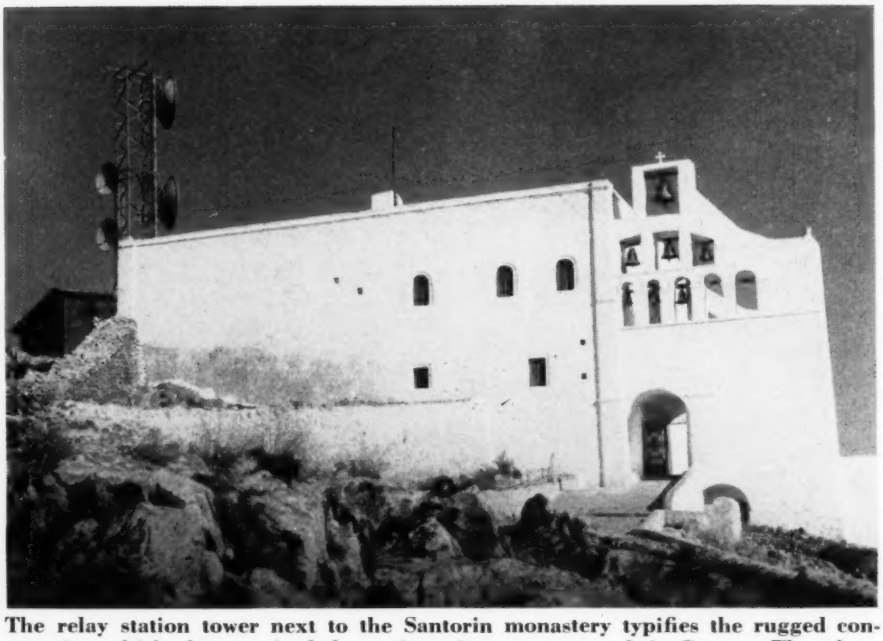
One of the stipulations under which the ECA undertook to finance the rehabilitation and expansion project called for the merger of the AETE and PTT systems into a single administrative organization to be operated as an autonomous government-owned corporation that would absorb the Cables and Wireless franchise upon expiration of that agency's concession in 1955. Accordingly, the new Telecommunications Organization of Greece (OTE) was officially established on Oct. 21, 1949.

Advisory Group

Such a merger required considerable organizational and engineering guidance if the OTE was to reap fully the benefits of the newly integrated local and long distance operations. Too, much of the proposed new equipment, particularly radio, was unfamiliar to the OTE technicians; so the IT&T advisory group was called upon to lead the company through its formative months, assisting with engineering problems and advising on operational and organizational procedures.

In order to grasp the full significance of the recovery made by the Greeks, it is necessary to recall the condition of the country's telecommunications system just prior to 1949.

Much of the PTT's outside plant had been damaged extensively during Greece's occupation by the Germans and the Italians. Continuous sabotage of this plant by Greek guerrillas after the liberation in 1944 left the country with very few serviceable toll lines, and even those that were operable provided only sporadic telephone or telegraph service because of damage to terminal equipment or lack of spare parts to make repairs.



The relay station tower next to the Santorin monastery typifies the rugged construction which characterized the entire microwave network in Greece. That these towers, built at an elevation of 575 meters above sea level, were properly designed has been proven by two earthquakes in the past two years.

Toll line repair during the period of bandit activity had to be made either by signal units of the Greek National Army or by PTT employes accompanied by escort troops furnished by the army. Night work on the lines was prohibited for security reasons and, in most outlying districts, even daytime work was considered hazardous for civilian employes.

Before the Greek army finally subdued the guerrillas and effective rehabilitation of lines could begin in the summer of 1949, roughly 10,000 Greek villages had been deprived of all means of communication. Urban areas fared somewhat better, although they, too, suffered severe damage at the hands of the retreating Germans and, later, the guerrillas.

In some instances, entire sections were without communication when cables were cut; and complete installations were dismantled and carried abroad. The number of telephones in service by the AETE was gradually reduced until only 18,000 subscribers were being served out of a prewar total of better than 42,000.

Thus, the ECA's telecommunications project in Greece was actually more a job of reconstruction than one of repair. During 1950, 1951 (when the Mutual Security Agency replaced the ECA), and 1952, more than 6.5 million dollars worth of equipment and supplies were ordered for the program from various manufacturers.

Major projects in the program included the establishment of national and international radio circuits, long distance telephone and telegraph networks with carrier systems, long distance offices in major Greek cities, Teleprinter exchanges, local telephone networks, and the installation of local automatic telephone lines in Athens and a number of provincial towns. Completion of these projects also required the purchase of additional mate-

Hauling cable up this centuries-old Roman road with its built-in steps was typical of the transportation problems encountered in the construction of the Greek microwave system. This cable was used at the station which is the "jumping off" point for messages going to the island of Crete.

rial by the OTE, as well as the expenditure of some 133 billion drachma (over 4 million dollars at the current rate of exchange) for land, buildings, and installation work.

Long Distance Network

Perhaps the most singular accomplishment of the entire program has been the extension of the long distance network on the mainland and to the important islands of Greece for the first time by means of four PTM microwave radio relay systems, which lend themselves particularly well to the country's mountainous terrain and scattered islands.

This phase of the program, completed in 1954, includes 35 radio relay stations and provides nearly 12,500 channel miles of urgently needed toll circuits between insular towns, the Greek mainland, and the rest of the world.

Simultaneously, telegraph service to the islands has been vastly improved, and provision is being made for radio broadcast channels for the National Broadcasting Institute of Greece.

In 1950, however, when the microwave system was still under discussion, the Ionian Islands, the Aegean Archipelago, and the island of Crete communicated with the Greek peninsula by an inadequate network of submarine telegraph cables supplemented by radio-telephone equipment supplied by the U. S. Army.

This system, because of its limited capacity, was incapable of offering any effective contribution to Greek economic development, so a call for tenders for a vast telephone and telegraph system went out to electronic equipment manufacturers all over the world. The offer accepted was that of Le Materiel Telephonique (LMT), French manufacturing associate of IT&T, and a pioneer in the microwave field.

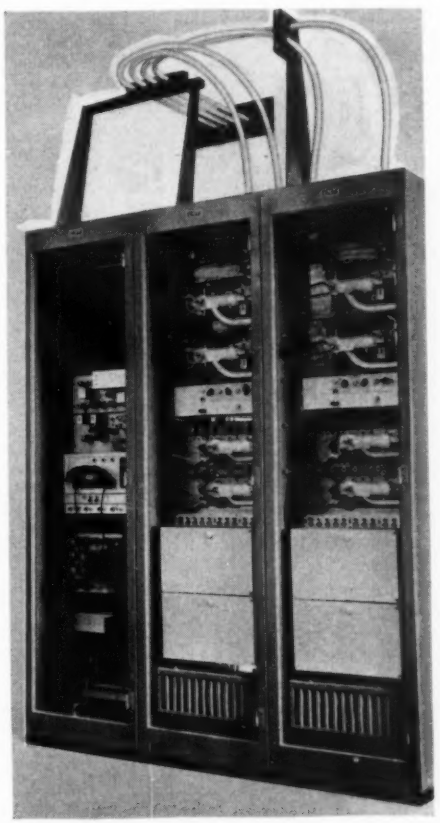
The selection of LMT to carry out this very important program was particularly appropriate, for the French company, together with another IT&T associate, Standard Telephones & Cables, Ltd., of London, had presented the world's first public demonstration of microwave communication on Mar. 31, 1931, with the establishment of an experimental telephone and Teleprinter circuit between Dover and Calais across the English Channel.

Relay Sites

In setting up the Greek network, LMT engineers spent the entire year of 1951 carefully surveying sites and choosing relatively accessible high points in the line of sight for the relay stations. Meanwhile, at LMT's plant outside of Paris, production was already under way.

The Mount Pelion relay station, built largely with local materials, is typical of the structures used in the Greek microwave system. There are three rooms, an engine room and lounge downstairs and a radio equipment room on the second floor.

By the end of 1952, the first shipments of material began arriving at Piraeus, the port of Athens, where approximately 500 tons of equipment were eventually unloaded. From a central storage depot there, material for outlying installations was transported by sea to the most convenient landing point—reaching its ultimate destination at times by truck, but more often by mule pack or on the backs of the workmen. At the same time, station buildings designed in the classic style of Thessaly and the Archipelago and surmounted by antenna masts, began to rise along the microwave route.



The standard "radio bay" at the relay stations consists primarily of two transmitter-receiver sets. Above them are the heavy coaxial cables connecting each to its associated antenna.

The year 1954 saw the final installation and testing of equipment, and all branches of the system were placed in operation.

The Ionian network comprises four telephone and telegraph channel groups between Patras—Greece's second largest port in tonnage handled—the islands of Corfu, Lefkas, and Paxos, and finally the city of Preveza, on the Epirian coast. This network connects to the land lines of the continental network at Patras and Preveza.

On the mainland route, 20 telephone channels link Athens and Salonica, the two largest cities in Greece. To set up the relay stations along this branch of the system, use was made of coastal mountains ranging in height from 4,900 to 6,500 feet, including the familiar Pelion and Ossa peaks.

The Mount Pelion station, typical of the structures used throughout the radio-telephone network, is a two-story, three-room building. On the ground floor are the engine room and quarters for the personnel, while the equipment is installed on the second floor.

Buildings of this type, together with steel antenna masts, proved better

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XUM

IN THE NATION'S CAPITAL

BY FRANCIS X. WELCH, WASHINGTON EDITOR

Dominating topic among lawmakers is politics as 84th Congress is called to order. Effort to diminish state commission jurisdiction over co-ops a possibility. Hush-a-Phone case before FCC ended. . . . Ruling in favor of telephone companies.

"THE SPEAKER of the House called for order. Congress rose and looked up at the chaplain. The chaplain looked down at the Congress. Then he raised his eyes to Heaven and prayed for the country!"

It has been several years since an irreverent newspaper reporter thus described, in mildly cynical fashion, the opening of a congressional session. But in all seriousness, there was plenty for the chaplain to pray about when the second session of the 84th Congress was called to order in the Nation's Capital on Jan. 3.

The one great overhanging problem, of course, was the continued international tension. There's the cold war between the East and West, which seems to be on again. Then, there's the arms race and the numerous stubborn trouble spots of actual fighting throughout the world. There were plenty of other problems nearer at home for Congress to tackle.

But the dominating topic on the home front at this time seems to be politics. That is to say, it is the most dominating with the *politicians!* The Man in the Street actually seemed to be more interested in Grace Kelly and her Prince and rehashing the Bowl games. But the politicians are really straining at the leash—if any.

This is inevitable in a nation, such as ours, which elects a President once every four years; a representative once every two years; and a senator once every six years—all for stated terms. The rigidity of this arrangement has inevitably built up a preordained cycle of political hullabaloo, campaigning, conventioneering, and pre-conventioneering.

And with typical American dynamism, our political activities tend to become bigger and louder, more expensive, longer lasting, as the years go by. And just as the merchants have let their Christmas sale enthusiasm carry them to a point where it now antedates Thanksgiving, to some extent, so the people who plan and promote our political campaigns (if you want to call it planning) threaten to get out of hand by making the "open season" longer and longer. It has gotten to the point where we hardly elect one bunch of candidates to Congress before the busy bee promoters are hatching out strategy for the next bunch.

All this is by way of suggesting that there will be more noise than action at the second session of the 84th Congress. Nearly every bill introduced, every speech on the floor, every activity in the committee will take place with one eye on the political effect. This is always true to some extent. But in a presidential election year it goes double.

Along about May or June it will be an everyday occurrence to walk into either the House or the Senate and see a lawmaker orating, with both arms waving like a windmill, with his tongue in high and his mind in neutral, while a nearly empty House otherwise features a handful of colleagues reading newspapers or chatting among themselves. This congressman will not be addressing his colleagues. He will be talking for the "Record"—to be transcribed, reprinted, and circulated next fall during the campaign. He cares not whether his colleagues listen or not; or whether they leave the chamber.

Be that as it may, our two-party system shows up better than any other democratic parliamentary system now in operation. The French Republic, for example, recently concluded a streamlined six-week campaign. And what happened? The electorate voted to put back the same bunch of monkeys in the tree that the Prime Minister had tried to chase out of there before Christmas—plus a few additional Communists and right-wing screwballs. That is the way the so-called multiparty parliamentary system works. Numerous parties confuse the electorate and make it impossible for the voter to choose between any clear-cut alternative.

By this time next year we, in the United States, may not have the best possible government in the world that the human mind could devise under any possible circumstances. But at least it will be there for four years and the Congress will be there for two years. Under our system it is impossible to have governments falling over and folding up like bad musical comedies. Nor do our Cabinet ministers play musical chairs every six weeks or two months, just because somebody happened to lose a vote of confidence. So, for all its faults, we ought to be thankful that our founding fathers gave us a system that is stable because the Constitution requires that it be stable, from a time standpoint.

Regulation and Co-ops

Some of the REA telephone cooperatives are unhappy about state commission restrictions. As reported in this department last week, the Indiana commission denied authority to the Hancock Rural Telephone Corp. to borrow $70,000 from REA in addition to two previous loans of $431,000 on which it had failed to pay any principal or interest. That co-op, organized in 1952, was even delinquent in paying its current accounts, including back office rent.

It will be recalled in that Indiana case that the telephone co-op's rate

structure made no over-all provision for taking care of its obligation to federal REA. The state commission said that approval of such a loan would be a disservice to both the borrower and the public. It added that "the fact that the proposed creditor happens to be the United States Government as contrasted to a private source of funds in no way mitigates the dereliction of duty or condones the economic immorality of the act."

A somewhat similar situation has been condemned by the Illinois Commerce Commission. This case involved the Adams Telephone Co-operative, which sought to buy out a small commercial company, Payson (Ill.) Farmers Telephone Co. The question at issue in this case, however, was mainly one of adequate service. The Illinois Commission, upon the objection of a substantial number of Payson company subscribers, refused to approve the sale and ordered the Illinois Bell Telephone Co. to serve the territory. (Illinoise Bell had indicated its willingness to do so.) An appeal was taken to the Illinois courts, where the matter is still pending. But federal REA, meanwhile, has authorized a loan of $339,000 to the Adams Telephone Cooperative to carry out the proposed purchase.

At a recent regional meeting of the National Rural Electric Cooperative Association (NRECA), at Madison, Wis., a co-op attorney suggested that Congress take action which would prohibit state commissions from using their powers to thwart the expansion of cooperatives. This was reported in the *Rural Electrification* magazine (organ of NRECA) and may result in a future bill in Congress.

What form would such legislation take? Probably it would be a bill to permit (if not direct) the REA to approve loans regardless of state regulatory requirements. As the law now stands, federal REA may *not* authorize a loan to a cooperative until that cooperative has fully complied with the law of the state. And if the law of the state requires that the cooperative obtain approval of its financing or other proposed operations by the state public service commission, that becomes part of the preliminary conditions for obtaining an REA loan.

Section 201 (Title 2) of the Rural Electrification Act, as amended Nov. 1, 1949, authorizes the REA administrator to make loans for rural telephone service under certain conditions, including the following provision:

". . . Loans under this section shall not be made unless the administrator finds and certifies that in his judgment the security therefor is reasonably adequate and such loan will be repaid within the time agreed, nor shall such loan be made in any state which now has or may hereafter have a state regulatory body having authority to regulate telephone service and to require certificates of convenience and necessity to the applicant unless such certificate from such agency is first obtained.

"In a state in which there is no such agency or regulatory body legally authorized to issue such certificates to the applicant, no loan shall be made under this section unless the administrator shall determine (and set forth his reasons therefor in writing) that no duplication of lines, facilities, or systems, providing reasonably adequate services will result therefrom."

The two cases above mentioned in Indiana and Illinois demonstrate the wisdom of this policy of making federal loans depend on co-op borrowers (or any other kind of borrowers) meeting the requirements of state laws before getting an REA loan. It is an added protection for both the borrower and the telephone subscribing public. And most of all it is a protection for the federal taxpayer against laying out federal funds on improper and unwise rural telephone financing.

The trouble is, of course, that not all states have as much protection for all of these interests as seems to be the case in Illinois and Indiana. What's more, the REA co-op pressure groups are continually seeking to diminish the effectiveness of such regulatory authority over co-op financing, and other co-op operations, as now exists. They are repeatedly crying out against "interference" from state regulatory commissions. They say such regulation is unnecessary or, at least, is necessary only for purposes of keeping the business-managed public utilities in line. The inference here is that the cooperatives are far more enlightened and altruistic and perfectly capable of managing their own affairs without state regulatory supervision, whereas the privately owned, commercial utilities need and deserve all the regulation possible.

But it would not be too surprising to this writer to see the co-op lobbies promote the idea of freeing federal REA from the need of checking and clearing with state regulatory authorities before cooperative loans are approved. The reason is that the co-op lobbies can concentrate a good deal of pressure on a single federal law. It is much more difficult to get changes made at the state level in a large number of state regulatory laws defining the jurisdiction of the state commissions over cooperatives. Once the federal REA Act were amended, along this line with a few words, it would not make much difference *what* the state laws had to say!

This is not to suggest that such an amendment to the REA act will actually be introduced soon, or that it has a chance of passage even after it is introduced. But when suggestions for changing the REA act are made at NRECA meetings (regional or otherwise), there is usually a "follow through" in the form of resolutions. Not infrequently bills pop up in the congressional hopper by congressmen who are only too pleased to do whatever they think will make the co-op

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REA Makes $121,000 Loan in Texas

The REA closed its telephone activities in 1955 with a $121,000 loan to a Texas telephone company, the U. S. Department of Agriculture announced on Jan. 4. Details of the loan follow:

Northeast Texas Telephone Co., Bogata, on Dec. 26 was allocated $121,000, second loan.

The borrower plans to use these loan funds to provide service for the first time to 272 rural subscribers, and improved service for 28 existing subscribers in Hopkins, Lamar and Red River counties. This service will be in territory adjacent to the company's present operating area.

The Northeast Texas company proposes to acquire the facilities of the Sulphur Bluff Telephone Co. This system now serves 28 subscribers with 23 miles of line including 11 miles of toll line. The company intends to construct 120 miles of new line and a new automatic central office building at Birthright to serve the additional area. The 11 miles of toll line will be used in the expanded system. The remainder will be retired.

The two REA loans to this borrower, amounting to $621,000, will make possible new and improved service for 1,628 subscribers over 420 miles of line. Automatic central offices will be at Birthright, Bogata, Deport and Detroit.

Guy Smelzer is president of the Northeast Texas company.

XUM

THE Plant Man's Notebook

BY RAY BLAIN, TECHNICAL EDITOR

THE FOURTH Annual Symposium on Technical Progress in Communication Wires and Cables, held at Asbury Park, N. J., in December, proved an outstanding success. A total of 703 visitors registered for this meeting. Of this number, 504 represented engineering and 199 sales. Two hundred and forty-three companies participated in the meeting. Visitors were present from Canada, England, Sweden and Australia.

This annual symposium is accomplished through the joint efforts of industry and the Signal Corps Engineering Laboratories. A volunteer committee organized early each year plans and supervises the activities required to stage this symposium. Industry supplies the major part in the presentation of papers. This year, 26 papers were presented covering the development and use of various types of wires and cables in the communications industry. Several of these papers will be reprinted in TELEPHONY during the coming year.

From a paper titled: "Polyethylene-Insulated Telephone Cable" by A. S. Windeler, Bell Telephone Laboratories, Inc., the following is quoted:

"From almost the beginning of the telephone art, multiconductor telephone cables have been insulated with paper, applied as a helical tape or laid down directly on the conductor in the form of pulp. Solid paper has a dielectric constant on the order of 2.5 to 3.0; but in the case of either ribbon or pulp insulation, a considerable amount of air is included in the electric field surrounding the conductor, so that the composite effective dielectric constant is of quite low value, usually about 1.5 to 1.6 in a typical design.

"In recent years, various plastics and other polymeric materials (as they became available) have been studied as competitors of paper and pulp. From among the various plastics studied, polyethylene has been selected as the most promising competitor because of its excellent electric properties, including low dielectric constant and power factor (compared with other usable plastics) and high dielectric strength. "It is also highly impermeable to water or water vapor, and is available in the desired quantities at a reasonable price. In addition, it is considered probable that the long-term price trend will be downward."

The protection of plastic-insulated cables is obviously less expensive than that of paper-insulated types. The following remarks in this connection were made by J. W. Phelps, of the Bell Telephone Laboratories, Inc., in his paper titled, "Protection Problems on Telephone Distribution Systems":

"The dielectric strength of our standard polyethylene-insulated conductor cables is a number of times greater than that of conventional paper cables. It, therefore, can readily be seen that many of the surge currents which necessitate protection apparatus on paper cables will do no harm at all on polyethylene cables.

"The expectations for this type of cable are so high that protection features are being kept to a minimum in an effort to get realistic data on the susceptibility to damage of this type of cable, rather than to cover up data by overprotecting the cable. If experience shows that additional protection is needed for special services or in very high lightning incidence areas, the protection will be added as required."

A very good paper titled, "Transmission Characteristics of Rural Distribution Wire at Audio and Carrier Frequencies," was presented by John A. Brazee of the Whitney Blake Co., New Haven, Conn.

The following is quoted from another most interesting paper titled, "Rural Wire and Urban Wire for Telephone Distribution Systems." It was presented by A. P. Jahn of the Bell Telephone Laboratories. He said:

"The advantages which this type of wire possesses over the conventional type of small cables are headed by the fact that it is self-supporting. Because of its sheathless construction, splicing and terminating are simple operations requiring no costly or elaborate sealing techniques.

"From a transmission standpoint, the primary concern with wire of this type is the change in its characteristics between dry and wet weather conditions. In general, moisture increases capacitance, conductance and attenuation and decreases impedance, cut-off frequency of loaded wire, capacitance unbalance, and carrier frequency crosstalk. These matters present some problems in the widespread use of the wire.

"However, the B rural wire may be used in ordinary subscriber loops pretty much as though it were regular sheathed 19 gauge cable, including the use of H88 loading. It can be used for distances of about 10 miles, except where a signalling limit may further restrict the usable length of the B rural wire.

"When used for trunks, the recommended type of loading is B44, that is 44 millihenry coils at a spacing of 3,000 feet, in order to avoid any penalty due to the low cut-off in wet weather that would result from use of H88.

"That there was a need for this wire and that the developed wire met the requirements for a low cost facility is amply attested by the fact that over 40 million linear feet of B rural wire were used during 1954, its first full year in the Bell System. The 1955 usage of this wire will exceed the 1954 figure by 50 per cent."

One of the highlights of the meeting was a paper titled, "A User's View of Plastic-Insulated Conductors in Outside Telephone Plant," prepared by R. Foulkrod, chief engineer of the Michigan Bell Telephone Co., and presented by a panel of experts from this company. The following are the opening remarks of this paper:

"As a user of plastic-insulated conductors, the Michigan Bell Telephone Co. is seeking a facility which will provide better and more reliable service at less cost.

"On V-J Day there was a tremendous unfilled demand for telephone service due to the heavily restricted use of critical materials during the war years. This backlog of orders together with the high rate of demand in the postwar period has made an enormous construction program necessary. The magnitude of this program made the search for every possible means of obtaining economy of dollars and manpower essential.

"Plastic-insulated conductors were

first installed in 1951 in our toll outside plant and in the exchange plant the following year. Subsequently, the use of such insulation was extended to self-supporting, sheathless facilities for use in rural and urban areas.

"Before proceeding, however, we wish to point out that we believe the use of plastic-insulated conductors has provided a better and more reliable plant with greater economy."

The Michigan Bell has also done considerable work of plowing in various types of plastic-insulated wire and cable. An installation recently completed in a new housing development is entirely underground. This installation will be watched with much interest as it is believed that it may prove to be the most economical type of plant to install in many new housing developments.

The following is quoted from a paper presented by J. J. Gilbert, ocean cable engineer of the Simplex Wire & Cable Co. The paper was titled: "Developments in Submarine Communication Cables."

"The submarine cable is now over 100 years old, and judging from recent news items regarding new installations, it is still going strong. Its early years were attended by tribulations, the accounts of which make interesting reading today for the general public and arouse admiration on the part of present-day cable engineers for the courage and ability shown by the early workers in the field. It was undoubtedly due to the principles established by these early workers that the submarine cable art is still active.

"The basic principle, sometimes termed 'proven integrity,' is the refusal to accept any proposed modification in structure or material of the cables as permanent until it has been put through the ordeal of being placed on the ocean bottom, and has survived for an adequate time—20 years in the opinion of a distinguished British cable engineer. The minimum requirement in any new development in submarine cables, more than in most other fields, is to profit to the full from the fund of experience."

Two other interesting papers were presented—one by R. C. Mildner, of England, and the other by the Phelps Dodge Copper Products Corp., on the development and use of air dielectric cables. There has been an increased demand for this type of cable during the past few years for use in high frequency applications.

The speaker of the evening at the banquet was Maj. Gen. James D. O'Connell, Chief Signal Officer of the Army. General O'Connell stated that he had recently returned from the Sagebrush maneuver held in the South. While this maneuver required an increased use of radio and microwave, there was also a definite increase in the

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Plant Man's QUIZ

BY RAY BLAIN, TECHNICAL EDITOR

Q. We'd like to know what advantages, if any, may be derived from the use of printed circuitry in the fabrication of communication equipment?

A. It is a well-known fact that the most expensive, tedious, and time-consuming operation in the assembly of the average unit of electronic or electrical equipment is the hand-wiring of the circuits. This operation is also the most common source for errors which makes necessary expensive inspection procedures.

The use of printed circuitry eliminates this hand-wiring which results in cost reduction of as much as 50 per cent. Then, too, assemblies are simplified and production increased. Rejects are minimized, inspection time reduced, and a more uniform article is produced. Another important feature is that printed circuitry makes possible a greater degree of miniaturization.

Actually, money, time and space may be saved by the proper use of this method.

•

Q. Would you please tell us what method is recommended for measuring the direct current supply on a subscriber's line? Also, what current flow through the transmitter is recommended for best operation?

A. The direct current flow on a line may be measured by the wire chief when the test board is equipped with a milliammeter. When this is not the case, a portable milliammeter can be connected in series with the transmitter at the telephone instrument.

The proper current flow may vary with different types of transmitters. One manufacturer states that its transmitter gives the best performance when the line current is not more than approximately 60 milliamperes.

•

Q. What is the transmission equivalent of rural distribution cable?

A. Rural distribution cable does not have an external jacket over the pairs and its attenuation changes with the weather. For this reason, the wet weather attenuation should be considered in transmission calculations for the type of cable. One manufacturer of this cable indicates the following electrical characteristics:

DC resistance: 86 ohms per loop mile.

Mutual capacitance: 0.132 microfarads per mile (cable immersed in water).

Attenuation: 1.65 decibels per mile (cable immersed in water).

Dielectric strength: Guaranteed to withstand 20,000 volts dc between any conductors and between the conductors and supporting wire.

Insulation resistance: 10,000 megohm miles.

Loading coils can be installed on this cable, when required, to improve transmission. Eighty-eight millihenry coils should be spliced into the cable at 6,000-foot intervals.

•

Q. We are experiencing some peculiar trouble with the No. 6 dry cells on the magneto telephone of one of our subscribers. A substance like the white of an egg oozes out of the cells after they have been in service only a few days. We have changed the cells several times with the same result. We have tried dry cells that operate satisfactorily in another instrument, but they develop the same trouble in this one telephone. Can you suggest a remedy?

A. It is obvious from the tests you have made that the dry cells are not at fault so there must be some trouble in this particular telephone. It would appear that there must be a partial short on the battery when the receiver is on the switch hook. It is suggested that you make a test with a voltmeter or a milliammeter in series with the battery.

Normally, the upper outside limit for continuous drain on the average No. 6 dry cell is approximately 0.5 ampere. If cells are subjected to continuous drains of greater magnitude, sufficient heat may be generated to liquify the electrolyte. This action is known as spewage and causes a cell leakage of the type you describe as your trouble.

XUM

TROUBLE CLEARING

Accident Prevention in the Battery Room

BY L. N. MARTIN

THE BATTERY ROOM is not a particularly dangerous place. We certainly feel safer there than we do when out climbing poles or working in manholes. Nevertheless, accidents happen even in what should be the safest of all places—the home.

Those who try to prevent accidents might well consider the axiom of the hunter: "*Try to see the game before the game sees you.*" We might paraphrase this for our purpose to: "*Try to see the possible cause of an accident before the accident gets you.*" So let us look in the battery room to see what dangers may lurk there.

Of course, any of the common garden variety of accidents, such as slips, falls, and bumps may happen there. *All hazardous conditions should be eliminated. Rubber runners which not only lessen the chance of slipping, but protect the floor from spilled acid, should be placed where required. Busbars or other objects located so that a man could strike his head against them should be relocated or cushioned.* But let us look for some dangers that are peculiar to the battery room.

The principal ingredient of a storage battery (at least by weight) is lead and compounds of lead.

Lead is a poison. In fact it is a treacherous, insidious, and deadly poison. It is not spectacular. One does not acquire a dose of lead and drop dead. Lead is a cumulative poison, i.e., it is not eliminated by the body. Therefore, small doses absorbed over a period of months or years will accumulate until the body contains enough lead to produce alarming symptoms.

Even then it does its deadly work quite slowly. It may cause a painful condition called "lead colic," or it may affect the nerves, causing paralysis, or it may attack the brain, the lungs, or the kidneys. The victim may become completely incapacitated but may live for years.

Metallic lead is usually harmless, as it is not in a form that can be absorbed by the body, but all chemical compounds of lead, such as the sulfate and oxide found in the battery and the white lead and red lead used in paints, are dangerous. At one time painters accepted the illness that we now know to be due to lead poisoning as inevitable and life insurance companies would not insure them. Workers in storage battery factories were also poor insurance risks.

However, modern knowledge and modern methods have now changed this, and painters, battery men, and other workers in lead can be as healthy as any one. It seems that the painter used to take pride in his paint smeared hands. They were a badge of his profession. He did not even clean them when he ate his lunch or went home to dinner. Some claim that poisonous doses of lead may be absorbed through the skin while others say that this is impossible.

PART 46. The preceding article in this series appeared in the October 29, 1955, issue, page 22.

Be that as it may, it seems likely that in most cases the poison enters the body by way of the mouth. As a mere speck of these lead compounds is dangerous when it is inside the body, it is easy to see how lack of cleanliness on the part of lead handlers can lead to poisoning.

Now we hope that no one is getting "jittery" about lead poisoning. Worry or over-fearfulness about a possible accident often causes the very accident that one is trying to avoid.

The man who performs ordinary maintenance work on closed cells will not come in contact with the lead compounds; however, anyone who works on open cells, removing the plates from closed cells, or for any reason handling wet battery plates, should remember that he is dealing with a deadly poison. The preventive measures are simple: *When handling wet battery plates wear gloves, preferably rubber gloves, also coveralls. Do not eat or smoke on the job. Before going to lunch or leaving the job for the day, remove gloves and coveralls. Wash the hands and other exposed skin very thoroughly, also clean under the finger nails.* Then do not worry. These simple precautions will protect you.

There is one other way that dangerous doses of lead may enter the body. When replacing one or a few of the plates in a cell the new plates are reconnected by a process called "lead burning." This is really electric welding. The lead is not only melted but some of it is vaporized. If this vapor is inhaled the result may be very serious. *Before a telephone man undertakes the job of "burning" plates he should be thoroughly trained in this work by someone who understands this operation and the precautions to be observed.*

If we take the lead out of a storage battery about all that is left is sulfuric acid (diluted with water). Sulfuric acid is also a poison but its action is quite different from that of lead. Full strength sulfuric acid (1.800 specific gravity) is a very dangerous substance. Under the name "oil of vitriol" it was at one time used by thugs to disfigure or blind their victims. Our defense against this dangerous fluid is quite simple. *Do not permit 1.800 acid in the office.* There is no need for it as it cannot be put in the battery without first thoroughly mixing it with water and mixing strong acid with water is also a very dangerous operation, as the mixture may boil violently and splatter the workman.

Some companies order acid at 1.400 specific gravity which is half acid and half water by volume and is the strongest acid that should ever be permitted to enter the office. It is better, however, to order ready mixed electrolyte (1.210 to 1.220 Sp.Gr.).

When acid is mixed with water, it is not only diluted but a chemical reaction takes place which greatly reduces the corrosive action of the acid. Electrolyte is reasonably safe to handle but every battery man knows what it will do to clothing, especially cotton

clothing. Unless the skin is unusually tender it does no harm to dip the hands in electrolyte when necessary if the acid is promptly neutralized and washed off. Electrolyte splashed in the eye is dangerous.

It seems needless to say that if electrolyte should be swallowed it would act as a corrosive poison. But who would drink electrolyte? Some people are so careless or thoughtless that they will drink anything that looks like water especially if it is in a container that is ordinarily used for water. This tragic incident has come to our notice:

A jeweler was cleaning some silver articles, using a very poisonus solution which looked like water and which he had mixed in a drinking glass. He stopped his work to wait on a customer in another part of the store, leaving the glass on a show case. It was a very warm day and another customer entered complaining of the heat. He saw what he supposed was a glass of water standing on the showcase and took one swallow. He was dead in less than a minute.

While we have never heard of a case where someone drank electrolyte by mistake *it is a possible cause of an accident.* As a preventive we suggest: (1) *Label all containers used for electrolyte "ACID"*, and (2) *never handle electrolyte in a drinking glass or a teacup.*

To avoid damage to clothing, cotton coveralls are now available which have been treated to make them acid resisting. (Consult your battery company or telephone supplier.)

To avoid skin burns, a container should be in every battery room holding several gallons of water to which about a pound of baking soda per gallon has been added. A coating of vaseline on the hands will give some protection when it is necessary to dip the hands in electrolyte but, whether or not the vaseline is used, the hands should be washed in soda solution as soon as possible after the exposure.

The soda solution is also convenient for wiping up spilled electrolyte and for cleaning the outside of the cells. It should never be allowed to get inside the cells and for that reason the container should be properly labeled.

Should electrolyte be splashed in the eye, wash out with clean water. Then see a doctor.

There is another way that sulfuric acid can cause an injury. The gas that comes from the battery during a prolonged charge contains fine particles of acid. In the old days, when prolonged charging was the rule, a battery man often boasted of his ability to remain in a gas filled battery room without coughing while he read all of the cells. Those were unscientific days and nobody followed up these cases to see if such men later acquired some form of lung trouble.

We do not have a medical opinion on this, but common sense tells us that *a gas as irritating to the air passages as battery gas should not be breathed.* Fortunately, it is now rarely necessary to gas a battery. When this does become necessary, as it may when giving an initial charge or treating a battery for sulfation, *arrangements should be made for adequate ventilation.*

No one is likely to put salt in a battery but in some seacoast exchange it might happen that a hurricane or a tidal wave would flood the battery with sea water. The action of sulfuric acid on salt releases the deadly chlorine gas (one of the gases used in gas warfare). This kind of disaster has happened on submarines. We hope that it never happens in a telephone office.

Battery gas is also explosive, as its principal components are oxygen and hydrogen. Why then are such accidents somewhat rare? Every motorist knows that if the mixture of gasoline vapor and air is either slightly rich or slightly lean the motor does not run well and if the mixture is much too rich or too lean, it does not explode and the engine stops.

To explode battery gas, the proportions of oxygen and hydrogen must be just right and furthermore there must, at that time, be a spark or flame to set it off. Therefore, the two conditions, correct mixture and a spark, may not occur very often, but they can and do happen at times.

If an open battery explodes there is no direct harm to the cells but the entire battery room (or battery cabinet) explodes. We are familiar with one case in which a large telephone building was ruined and the service failure was complete. In the case of a closed cell battery the explosion is usually confined to one cell, although adjacent cells may be damaged by the force of the blast. In a closed cell, it is not necessary that the cell be gassing in the usual sense to form an explosive mixture. If the cell is charging even slightly, some gas is formed and this accumulates within the cell.

All closed cells should be equipped with safety vents, which effectively prevent a spark or flame on the outside from touching off the gas within the cell. However, the filling caps must at times be removed and the two explosions which this writer witnessed happened when the filler caps were off. *Safety filler openings are now available.* They extend down below the level of the electrolyte.

The spark which sets off an explosion may be caused by some work operation near the battery which causes a short circuit. Of the two cases which we witnessed, one was caused by a workman making a short circuit with his pliers and the other by a workman replacing a mica fuse. Sparks may also be caused by static electricity generated when a man walks over a well-insulated floor.

Only absolutely necessary work should be done near a battery when it is gassing or when the filler caps are off and then the utmost care should be used. Static discharges will be avoided if the workman will touch the grounded end of the battery or a ground bus-bar with his hand just before working on the battery.

Is there any danger of electric shock in the battery room? The 24-volt and 48-volt batteries are usually considered harmless. However, we know of one case where an unusual and prolonged contact with 24 volts caused a man much pain and the loss of three days work. We cannot be sure that any voltage is absolutely safe and *we should not make needless contacts with any voltage.* We know by just reading the newspapers that many people are killed by the ordinary 110-volt house current.

Therefore the 130-volt plate or telegraph battery that is installed in many offices is equally dangerous and should be treated with respect.

In all cases of fatality due to low voltage (150 volts or less), it will be found that the contact with the body was unusually good. (Or shall we say "bad.")

Electricity can cause accidents in another way. An electric arc can cause deep burns or put out an eye. It can also start a fire or cause other property damage. Low voltage can produce a bad arc. Fifty volts or less are used for electric welding and a six-volt automobile battery is often used for welding lead. The arc is dangerous in proportion to the amount of current (amperes) that is available.

The battery room is a bad place for arcs because the main battery often has a capacity of several hundred amperes. Also in the battery room it is possible to short circuit the battery ahead of the main fuse; hence, there is no fuse or circuit breaker to open the circuit and stop the arc.

No one has worked in a central office very long without seeing a screw driver or a pair of pliers that has been melted by an accidental electric arc. Now, it requires about 3,000°F. to melt steel, so the man who held that screw driver

(Please turn to page 52)

XUM

THE Operator's Corner

By MAYME WORKMAN — TRAFFIC EDITOR

SOME time ago, at a state convention, a manager from a small exchange requested me to write something about the habit some operators have of eating and drinking at the switchboard, and I regret it has taken me so long to do so.

To operators working in a large exchange, it may seem incredible that such a condition could exist, but this has frequently been a problem in small exchanges.

Usually in a small office, customers coming to the central office to pay a bill or place a long distance call, see the operators on duty, and it will not leave a good impression with the customer to see operators nibbling on a sandwich, a candy bar, or what have you, or drinking a coke or ice-cream soda. The first time the customer has to wait to be answered, he will visualize the operator, as he has seen her, and he will be resentful, thinking, "If she would pay more attention to answering my call, and not so much to filling her stomach, I could get a little service."

Perhaps at that particular time, the operator is not eating nor drinking, but the customer has no way of knowing this and, like the elephant, he has a wonderful memory.

Perhaps the operator is quite busy at the moment and there is a legitimate reason for the delay, but when she answers the customer she can sense from his attitude and manner that he is displeased because he had to wait.

The operator may feel resentful, knowing she has answered him as quickly as possible, never realizing she has built up the resentment in the customer's mind by her actions on another occasion.

Then too, eating, and particularly drinking at the switchboard could have a disastrous effect, if the drink is spilled and damages the switchboard.

Of course, when an operator is on duty, her time has been purchased by her company in the form of wages, and she should devote her undivided attention to the work at hand. There are some exceptions, such as in an agency office, but even there eating and drinking at the switchboard should not be a practice for the reasons previously stated.

There are certain rules of conduct that are applicable in any business establishment, and telephone exchanges are no exception, regardless of the size of the exchange. A telephone operator's conduct should always be above reproach in her contacts with customers since she is representing the company she serves, and the customer forms his opinion of her company by her conduct.

If more than one operator is on duty in a small exchange, they should also practice courtesy toward one another while on duty. If a customer comes to the central office, or when he has occasion to use his telephone, if he hears operators wrangling or being discourteous to one another, it will leave a bad impression with the customer.

It makes the day so much more pleasant and the job so much easier if everyone works harmoniously, each operator doing her part and rendering assistance to other operators, when warranted.

Keeping the voice highways clear, speeding the messages to their destination, keeping customers happy, is every operator's job. Failure on the part of one operator to observe the office regulations does not license other operators to follow her example.

Imagine what would happen on the highways if every driver would follow the bad example of other drivers and proceed to emulate them! Our traffic fatalities would be even greater and no good would be accomplished.

The same holds true of our voice highways. If one operator fails to follow the correct procedure, it will not help matters to grumble about her actions nor to follow her example. We have only our own actions to account for and sooner or later the offender will be in difficulty.

The old "Golden Rule" is still a good motto to follow. It accomplishes wonderful results on and off the job.

If you are an operator in a small central office and have been "snacking while on duty," won't you resolve to discontinue this practice in the future? Your manager will appreciate your cooperation and, indirectly your customers will appreciate it, too.

Traffic Questions

(1) If the outward operator receives a report from the route or rate operator that the called place is not listed, but suggests a toll center to try, what information is entered on the ticket?

(2) Before reporting "NF", should the information operator at the called place ask to speak to the calling party to determine whether the details given are incomplete, misunderstood, or incorrectly spelled, or whether the call has reached a wrong place?

(3) If the information operator at the called place attempts to give an NF report without speaking with the customer, what action should be taken by the outward operator?

(4) If the information operator at the called place reports NF after dealing with the customer, how should the outward operator proceed?

(5) When you receive a report that the called party is not registered, how do you proceed?

Answers are presented on page 52.

Future of Automation

"[Automation] is a blessing to labor, because in the end it will insure more jobs at better wages. The more machines men have to aid them, the better jobs they will have, the higher pay they will be given for their work, and the more new kinds of occupation will develop."—HENRY H. HEIMANN, *executive vice president, National Association of Credit Men.*

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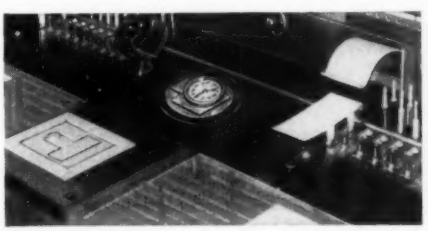
RATES and ROUTES can be just SECONDS away

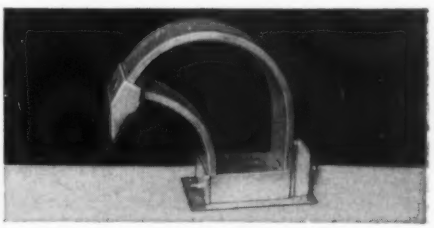
WITH WHIZ TUBES—the new, low-cost pneumatic ticket tube system—rate and route desks and switchboards are never more than 25 ft. per second apart! Operators send and receive toll tickets with the speed and convenience of plugging in a jack.

WHIZ Tubes, engineered and installed by International Standard Trading Corporation, associate of International Telephone and Telegraph Corporation, are suitable for all types of exchanges. Combining pressure and vacuum principles, the system uses a minimum of space and power. No revolving parts at switchboard and rate and route desk—just small, conveniently located sending and receiving terminals. Corrugated tubing gives extra reliability—minimizing the effects of static, friction, and humid air on ticket flow.

Why not investigate WHIZ Tubes for your telephone operation? Find out, without obligation, just how much your service can be speeded up . . . how much money you'll save on operating costs. Write today for full details.



Pressure receiver at right, below the jack panel, delivers a ticket. Operator's vacuum sender is at left. Pressure senders are similarly flush-mounted in rate and route desks.



Compactness of this automatic vacuum receiver permits mounting multiple banks of units in a minimum of space on rate and route desks.

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—Advertising and Publicity kits which show you how to

BRING YOUR STORY TO YOUR CUSTOMERS

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PROGRAM:
LENGTH:
SPONSOR:
Sound Effect: Telephone ringing.
Announcer: I'll bet that's (your company name here)
telephone jingle.
Sound Effect: Phone being taken off the carriage.
Announcer: Hello.
telephone jingles
Better than finding a nestful of eggs On Easter morning, is getting a call And hearing the voice of a faraway friend It's the happiest Easter surprise of them all.
REMEMBER: You'll make someone happy If you call on Easter day.
EXTENSION PHONE?
BEDROOM...KITCHEN
PORCH...WORKSHOP
BASEMENT...GARAGE
LOW IN COST
HIGH IN CONVENIENCE
Saves time, steps and effort
ORDER YOURS TODAY
When Alice Newcome came to town
She hardly knew a soul to speak to.
Friendly folks have called her up,
She feels at home, in just a week too!
You'll make someone happy
If you telephone today.
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Many K500 telephone customers have asked us questions about methods of promotion and public relations for independent telephone companies. We now have a complete answer to these questions . . . a publicity kit and an advertising kit.

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The United States Independent Telephone Association maintains representation in five outside organizations, the activities of which concern communications and general business.

These organizations are:

(1) LIAISON WITH THE DEPARTMENT OF DEFENSE. USITA Military Liaison, Col. W. C. Henry, Bellevue, O.

(2) AMERICAN STANDARDS ASSOCIATION. The USITA has indirect representation in the American Standards Association, an organization concerned with the development of industrial standards, particularly with reference to methods of measurement and material specifications. The USITA indirect rather than direct representation arises out of it being treated as a part of a so-called Telephone Group which as such has a direct membership. The Telephone Group consists of the AT&T and the Independents, and its name is merely a name of convenience for the purpose of representation in the American Standards Association.

USITA General Representative (Standards Council). L. W. Hill, Tarboro, N. C. (Alternate to G. C. Richert, Washington, D. C.)

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Committee on Radio (C-16). C. H. McLean, Chicago, Ill. (Alternate to R. P. Martin Jr. of Bell Telephone Laboratories.)

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Committee on Graphical Symbols for Use on Drawings (Y-32). B. C. Burden, Lincoln, Neb. (Alternate to R. V. Rice of Bell Telephone Laboratories.)

Committee on Accident Statistics (Z-16). H. C. White, Jamestown, N. Y. (Alternate to E. S. Miner of AT&T.)

Committee on Acoustical Measurements and Terminology (Z-24). B. C. Burden, Lincoln, Neb.

(3) RADIO MANUFACTURING ASSOCIATION. Sub-committee on Selective Signaling. C. H. McLean, Chicago, Ill.

(4) RADIO TECHNICAL COMMISSION FOR MARINE SERVICES. Creation of this group arose out of a suggestion of the State Department early in 1947. It deals with marine communications and radio aids to navigation. USITA Representative, R. H. Herrick, Lorain, O. (Alternate to Dr. Austin Bailey of AT&T.)

(5) UNITED STATES CHAMBER OF COMMERCE. National Councillor, Carl D. Brorein, Tampa, Fla. Committee on Transportation and Communication, Mr. Brorein.

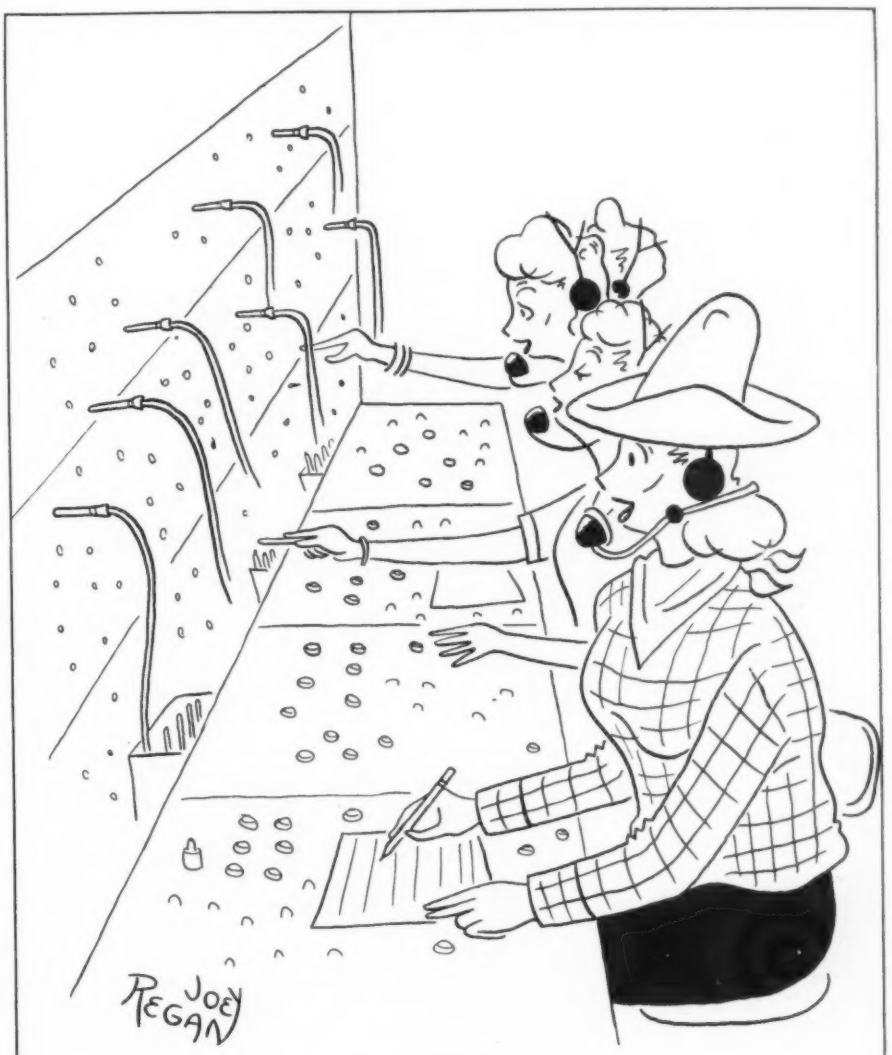
General of Michigan Trains Korean Engineer

General Telephone Co. of Michigan, Muskegon, is having a hand in schooling a future wire maintenance chief from a large Korean city. The company on Dec. 21 welcomed Yoo Kun Oh, chief of the engineering section of the Taejon Telecommunications Bureau, Ministry of Communications of the republic of Korea, to a four-month stay for on-the-job training.

Mr. Oh will visit the company general offices daily for on-the-job training in maintenance methods used by General Telephone, including training in operation and maintenance of automatic and manual switchboards. In addition, he will study methods of preparing cable records, utilization of testing equipment and preventive maintenance in general. He will also visit many of the company's 78 exchanges in Michigan.

The Korean engineer who is from Taejon, famed as part of the "Iron Triangle" battle sector of the Korean conflict, was sent here under the joint sponsorship of the OEC and the republic of Korea Ministry of Reconstruction.

He will return to Korea as wire maintenance chief in a large Korean city now equipped with a 4,000-line manually-operated switchboard telephone system.



"Yes, this is the operator who will put your call through to Texas!"

XUM

If you could look inside Automatic's extensive research laboratories, you'd see fast-growing activity in electronics.

Part of it is basic research, aimed at learning more so we can serve you better. Part is applied to improving existing products or developing new ones. Here and there, a development project originates with a customer's request for equipment to meet new needs; the result—a "miracle made-to-order."

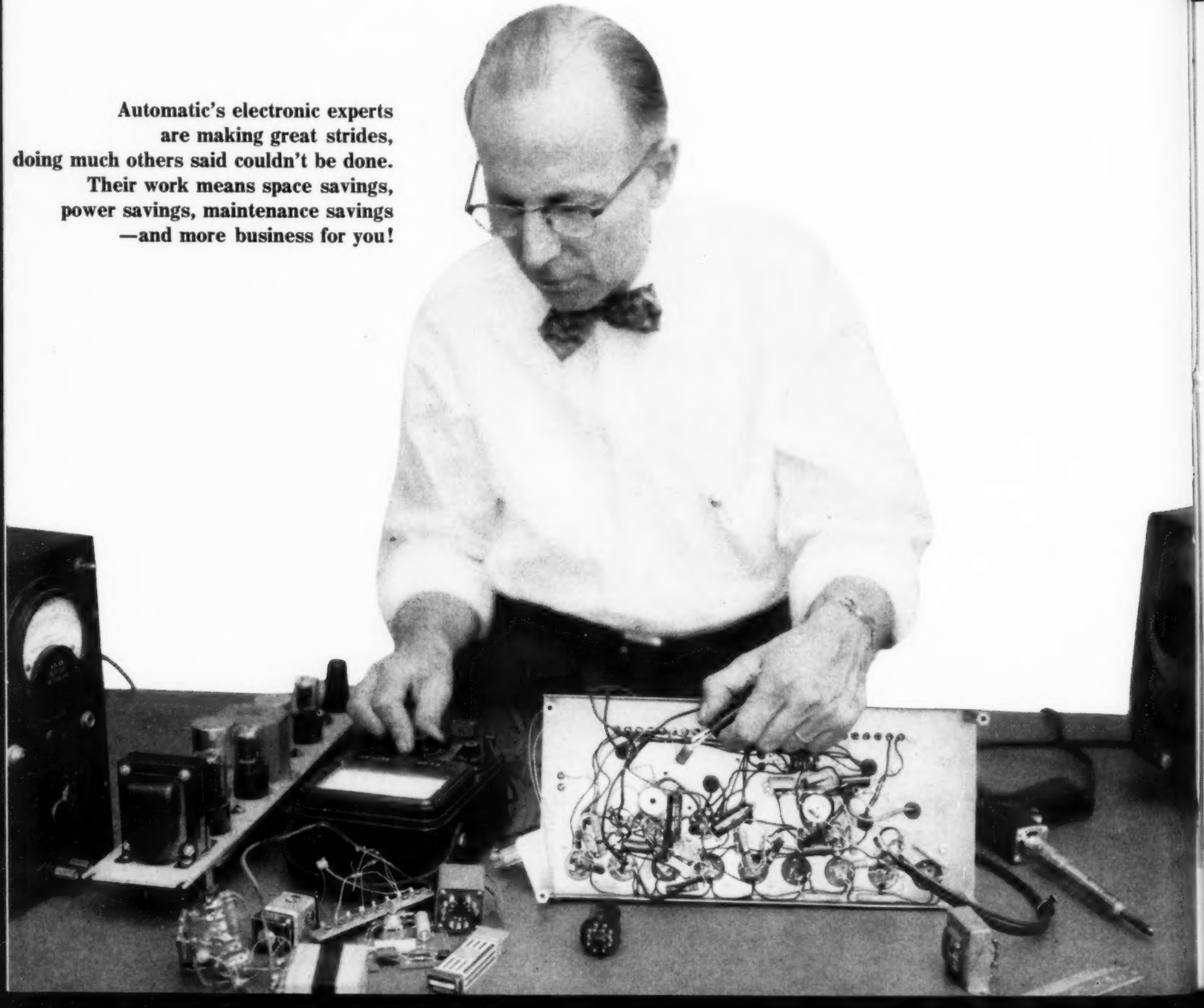
Ideas are the foundation of this work. Our laboratories have been staffed by carefully selecting the kind of men who *have* ideas—men trained to think far ahead. Working singly and in groups, these men originate and discuss each new electronic device. Then, they put in long hours making it take shape on the drawing board, making it work in the "breadboard" stage, and perfecting it for manufacture. They make sure it will really benefit you, and that electronics *is* the best solution to the problem.

Research is costly. But the many thousands of dollars we put into it every year have proved their worth hundreds of times, in better telephone service, better business for telephone men. Keep your eye on Automatic for the latest and best in electronics.

For full details on any of the products shown here, write: *Automatic Electric Sales Corporation, 1033 W. Van Buren St., Chicago 7. Or, Call HAymarket 1-4300.*

Automatic's researchers make "miracles-to-order" with

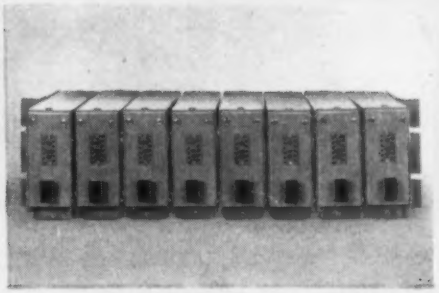
Automatic's electronic experts are making great strides, doing much others said couldn't be done. Their work means space savings, power savings, maintenance savings —and more business for you!



Here are a few of Automatic's achievements in electronics...

TRANSISTORS: Constant research on manufacturing techniques aims at increasing transistor stability and life. Research on applications is producing new products that save power, space, weight.

NEW TRANSISTORIZED TYPE 80 MONOPHONE: A completely self-contained transistor amplifier provides extra gain for hard-of-hearing subscribers. Transistor amplifier inside housing amplifies up to 16 times. Convenient volume control behind cradle. Amplifier draws power from line—needs no other power supply. Circular 1823.

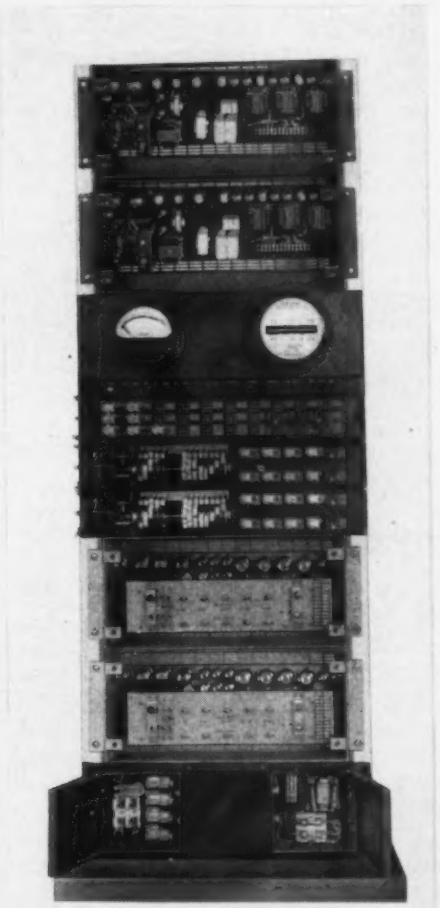


NEW TRANSISTORIZED VF REPEATER: Eight complete repeaters on a 19" shelf—only 5¼" high. Each provides maximum gain of 10 db on NL cable or open wire, and 6-8 db gain on loaded cable. Operates on 48-volt exchange battery or a few dry cells. Saves weight and space usually occupied by power supply. No heat dissipation problem—each repeater draws only one watt. No tubes to burn out.

electronics!

AUTOMATIC RECORDER-ANNOUNCERS: Complete line of four fully-electronic announcers offers types for time announcements, weather bulletins, "intercept" announcements, and fire calls. Revenue-earning advertising can be included where appropriate. Circular 1845.

NEW TRANSISTORIZED OPERATOR'S HEADSET: Amplifies caller's voice up to 16 times. Lightweight transistor amplifier measures only 2½x1⅜x3". Amplifier in plug starts working when operator inserts plug in position jack. Needs no power supply. Circular 1823.



ELECTRONIC RINGING MACHINE: Generates electronically five ringing frequencies plus all tones required. Generating equipment has no moving parts to wear. Offers extraordinary frequency stability, low maintenance, and freedom from over-ring and cable noise. Circular 1734.

AUTOMATIC ELECTRIC

ORIGINATORS OF THE DIAL TELEPHONE

GENERAL SYSTEM INDEPENDENT

XUM

1955 and the FCC

*By GEORGE C. McCONNAUGHEY**
Chairman, Federal Communications Commission

THE PAST YEAR witnessed significant developments in the field of electronics which have revolutionized radio, wire and cable operation. As a result, new services were born, old ones expanded and the demand for additional uses reached new peaks.

This is especially true of radio, whose new-found popularity in industrial, transportation and other pursuits has created a "housing shortage" in some parts of the spectrum. The net result is that the commission closed the year with more than 1.4 million radio authorizations on its books. These represented some 60 different kinds of radio services on the land, on the sea and in the air. They involved the use of over 800,000 fixed and mobile transmitters and over 1.1 million permits of different grades to operate them.

American adoption of broadcast for entertainment, information and education is emphasized by the fact that in 1955, for the first time, program stations with their auxiliaries exceeded 6,000 (now 6,600) in number. About 4,000 stations serve more than 120 million audio and 35 million video receivers.

American homes now have more radios than bathtubs, running water or refrigerators.

Homes with TV nearly equal the number equipped with vacuum cleaners, clothes driers and air conditioners collectively.

The AM broadcast service has grown to nearly 3,000 stations, of which over 2,800 are in operation.

Development of TV sees nearly 600 authorized commercial stations, with almost 500 on the air. In addition, of 36 authorized TV educational stations, 15 are operating. There is at least one TV station in each of more than 250 communities, and 100 other communities have two or more TV outlets. More color TV is definitely in the offing.

As for the common carrier services:

People talk more over the telephone than ever before. Nearly 200 million calls are handled daily by 54 million telephones. Telephone circuits now use microwave and coaxial cable links. Network radio and TV programming depends, to a large extent, on relaying over telephone facilities. Over 600 common carrier land mobile telephone systems are in operation.

More than a million messages (a new high) went over radio-telephone connections between this country and a hundred overseas points. The year saw preliminary work start on the first long distance submarine telephone cables—three—to connect North America and Europe, and to further link the United States with Alaska and Hawaii.

International telegraph and telephone carriers serving this country carried more than 520 million words and their revenues climbed to 63 million dollars.

The accelerated expansion of wire and radio services, plus the complexities of new technical developments, has multiplied regulatory and administrative burdens accordingly. In the past five years the commission's workload has more than doubled. Yet in fiscal 1955 it had to do the job with about the same money but with less personnel than it had in any year since World War II.

In consequence, its personnel of less than 1,100 is hard pressed to keep up with the near 10-billion-dollar electronics industry, perform its share of regulating the 16-billion-dollar telephone industry that has tripled in size since 1940, and administer to a broadcast industry whose annual revenues now exceed one billion dollars.

In fiscal 1955 the composite FCC work desk groaned under 430,000 applications of all kinds, 850,000 incoming letters, 20,000 tariffs and reports of common carriers requiring review, nearly 500 hearing cases, thousands of petitions and other legal filings in connection with hearing and rule-making proceedings, and nearly 100 court cases affecting the commission.

In addition, the commission had to wrestle with the growing pains or other problems of particular services; conduct special studies; maintain continuing contact with congressional committees in legislative and other matters; cooperate with government and industry in frequency usage, national defense and other projects; examine would-be radio operators; inspect radio stations; police the spectrum around the clock; investigate causes of serious interference; test and approve certain equipment; and, at the same time, try to keep up with kaleidoscopic developments in equipment and techniques insofar as possible.

That the commission has been able to carry on under such conditions is a tribute to the interest, loyalty and ability of its over-burdened personnel. From the key man down to the clerk and stenographer, one and all have cooperated time and effort far beyond their normal duty requirements.

The commission has shaved its procedures to the barest degree required by law and proper functioning. But the succession of mandatory oral arguments, bulky agendas for weekly and special meetings on which only the commissioners can act, the required reading of many and voluminous hear-

*This is the annual year-end statement by the chairman of the FCC.

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ing records, plus the daily deluge of petitions and motions, many of which have become repetitious, now consume so much time that the commissioners find it difficult to review or plan long-range policy.

The net result is that the commission is just able to keep its head above water in normal functioning. Any special projects which demand immediate consideration necessitate taking staff members off the processing lines and backlogs develop.

One particular handicap to expeditious FCC operation is a 1952 amendment to its act which prohibits the commission from consulting its own staff experts on adjudicatory cases even when the latter have no participating connection. This provision goes far beyond the separation of functions requirements of the Administrative Procedure Act, and the commission intends to ask Congress to remedy it.

An obstacle in getting new services into operation is another 1952 amendment which the courts have interpreted as requiring the commission to hear protests by "parties in interest" however remote and, meanwhile, stay any grant involved. The commission has repeatedly proposed legislation to curtail these delaying tactics.

Broadcasting presents its own special problems:

Congress appropriated money for the commission to begin a study of radio and television network broadcasting, long needed and often requested by the commission. A special staff is now at work.

The situation in television, especially with respect to UHF operation, is of mutual concern to Congress, industry and the commission. About 200 comments have just been received in a general rule-making proceeding to determine what should, or can, be done to resolve the difficulties hindering expansion of TV service on a national scale.

To help UHF stations compete with VHF stations, the commission has authorized "satellite" adjuncts, low-power operation, liberalized its multiple ownership rules, and removed restraint on station competition for the same TV network programs. It has also proposed UHF "booster" stations, and to allow TV stations to establish their own intercity relay systems.

Proposals for subscription TV constitute a separate rule-making proceeding in which nearly 80 large volumes of fervid pros and cons have been filed.

What to do, if anything, about community TV antenna systems is also facing the commission.

At the request of the commission, a joint government study is being made of the high frequency part of the spectrum to the end that the national interest may be served by the best use of this part of the spectrum. In so doing, it will explore the possibility of the government releasing some of its VHF space for further television development.

Further refinements and cooperation in radio's use are inescapable in order to utilize the airwaves more fully and economically. Science and industry are hard at work evolving ways and methods for "doubling up" on frequencies now in use and to go "upstairs" for transmission paths previously unworkable. Single side-band transmission and split-channel operation are being tested to this end.

The debut of "scatter" operation (bounding signals off the ionosphere or troposphere in order to reach over the horizon) holds promise for long distance communication.

Tall TV towers have become a particular concern to military and civil aviation. While most applications can be processed by FCC as conforming to its rules, others have to be referred to special aviation advisory groups, and some must go to hearing. Nearly 50 TV towers 1,000 feet or higher are in operation or under construction, and one applicant proposes a 2,003-foot shaft.

I have very briefly highlighted some of the activities of the Federal Communications Commission during the past year and called attention to some of the problems facing the commission. As long as the government has to deal with monied and competitive interests there will always be regulatory problems. These headaches will keep changing with the march of progress. Notwithstanding, radio and other forms of communication will keep going forward.

That is why I, personally, am content to let the industries over whom the commission has jurisdiction use their initiative and know-how to render the most public service with the least government regulation and red tape.

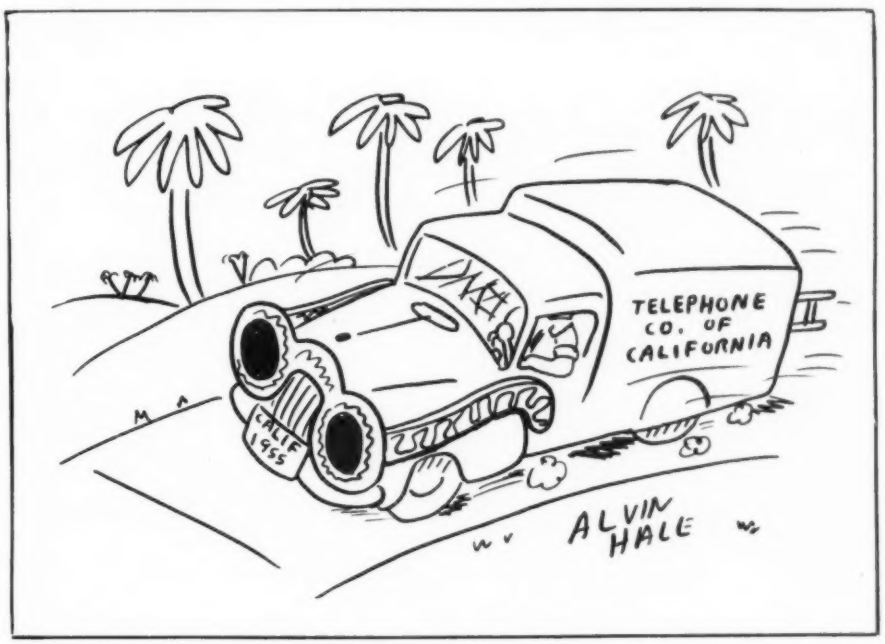
During the period of time I have been chairman of the Federal Communications Commission, I have been constantly impressed by evidence of the far-flung benefits of electrical communications expansion. Regardless of what today's or tomorrow's problems may be, the electrical communications industry as a whole will continue to prosper and pay off dividends that are both direct and indirect.

The commission, I know, is dedicated to the basic philosophy of progress in the communications field looking toward the ultimate benefits which will inure to the American public.

My prediction for 1956 is that radio and television will continue to expand in coverage and give more enjoyment, information, and cultural education to the American people. For 1956 I will also predict radio and television will play a more important role than ever in the national elections.

NE T&T Buys Mass. Company

The New England Telephone & Telegraph Co. is buying the Oakham (Mass.) & Coldbrook Springs Telephone Co., it was reported on Dec. 16. The company serves 123 customers.



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Courts and Commissions

General of California Asks $14,399,840 Stock Issue

General Telephone Co. of California, Santa Monica, has applied to the California Public Utilities Commission for permission to issue 718,862 shares ($14,399,840) of 4½ per cent preferred stock, $20 par, it was reported recently.

The shares would first be offered on an exchange basis to holders of the 1,437,724 outstanding shares ($28,754,480) of 5 per cent preferred, $20 par. The 4½ per cent preferred not issued during the exchange period will be offered publicly at $20.50 a share.

The General Telephone Corp. affiliate plans to retire the unexchanged portion of the 5 per cent preferred issue; to finance that step it has asked the commission for permission to issue 15 million dollars in debentures maturing 1981, and 5 million dollars in serial notes, to be retired from 1957 through 1966.

Proceeds from the sale of the additional shares of the 4½ per cent stock as well as that from the debentures not needed for retiring the 5 per cent issue, would be used in expansion, acquisitions and new construction.

Two Florida Independents Apply for Rate Raises

The Florida Railroad & Public Utilities Commission on Jan. 4 was to hear the application of Malone Telephone Co. for an increase in rates.

The commission, on Jan. 23 is scheduled to hear the application of Northeast Florida Telephone Co. for authority to increase rates at the MacClenny Exchange.

Wisconsin Company Granted Authority to Modernize

The Farmer's Union Telephone Co., serving Middleton and Cross Plains, on Jan. 3 was authorized by the Wisconsin Public Service Commission to spend $240,574 modernizing its plant.

The improvement is principally in connection with the company's plans to provide extended area service between Madison and Middleton. The commission had approved plans for non-toll service between Madison and Middleton last Nov. 2.

The plan of the company is to convert its present automatic exchange in Middleton from terminal per line to terminal per station and to install automatic equipment in Cross Plains. This work is to be done within the next two years.

Virginia Commission Rules On Local Telephone Taxes

The Virginia Corporation Commission on Dec. 30 ruled that the Chesapeake & Potomac Telephone Co. of Virginia can pass on some local license taxes to local telephone customers.

The order also will cover fees or charges based on receipts or poles, wires and conduits, and thus apparently supersedes a ruling by the commission last spring which permitted the C&P company to pass on local gross receipts taxes to local customers.

Under the new ruling, effective Jan. 15, the taxes will be permitted to be passed on under the following conditions:

"When a political subdivision of the state charges the company a license tax or franchise fee at a flat rate or based on receipts or based on poles, wires or conduits, such taxes and fees will be billed pro rata to the exchange customers receiving service within the political subdivision, if the aggregate amount of such taxes and fees exceeds one-half of one per cent of the aggregate bills of such customers for exchange service."

Oregon Commissioner Authorizes Loan

A loan of not to exceed $72,000 to the Creswell Telephone Co., from the Stromberg-Carlson division of General Dynamics Corp., was approved on Dec. 16 by Oregon Public Utilities Commissioner Charles H. Heltzel.

The commissioner specified that the proceeds of the loan are to be used to convert the entire system so as to furnish dial service and to reconstruct and add to its lines.

Neb. Company Incorporates To Qualify for Loan

The Indianola Telephone Co., Inc., was authorized on Dec. 30 by the Nebraska Railway Commission to purchase the properties, franchises and exchange at Indianola from the Indianola Telephone Co., a sole proprietorship owned by G. L. Jorgensen. Mr. Jorgensen becomes the president of the new corporation which began operations on Jan. 1.

The primary purpose of the transfer was to facilitate the obtaining of a loan from the Stromberg-Carlson Co., a division of General Dynamics Corp., of up to $77,000 which will be used to modernize the exchange. The Indianola company serves 376 subscribers and 36 switching subscribers in an operating area extending into two counties.

Two Missouri Independents Ask Merger Authority

The Blackwater-Arrow Rock Telephone Co., Gilliam, on Dec. 15 asked authority from the Missouri Public Service Commission to merge with Mid-Missouri Telephone Co., Gilliam.

Blackwater-Arrow Rock Serves Blackwater and the surrounding area. Mid-Missouri serves Gilliam, Marshall Junction and Arrow Rock.

Mid-Missouri asked the commission to allow it to issue 57 shares of $100 par value common stock to be exchanged for oustanding shares of Blackwater-Arrow Rock company stock.

Rate Plea in Kansas Based On $1.00 Minimum Wage

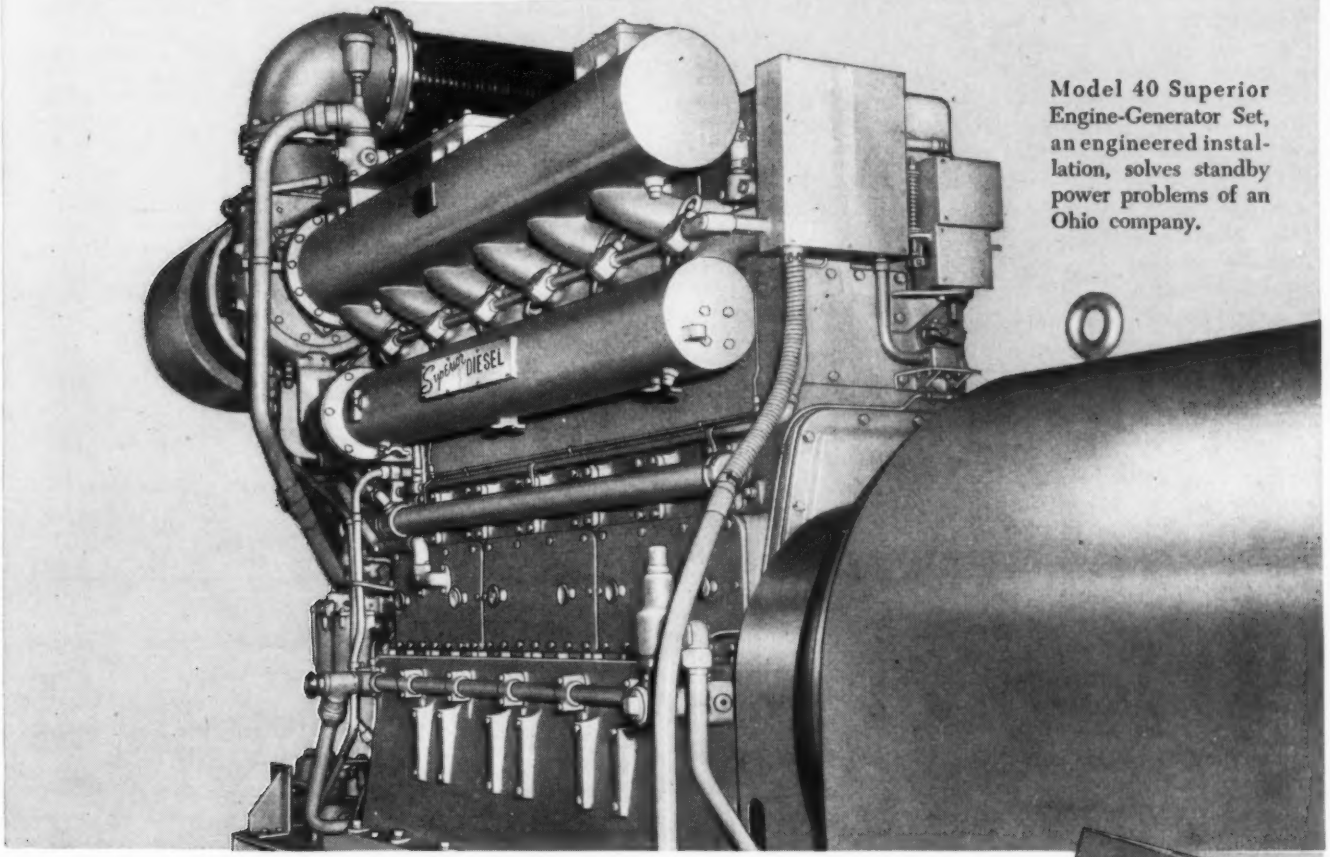
The Kansas Corporation Commission has set Jan. 17 to hear the Border Telephone Co., Syracuse, application to raise rates at Syracuse, Johnson and Manter.

L. Duane Walrafen, commission chief engineer, said the Border company has applied for a $7,074 annual increase. The company based its application on offsetting an increase of the federal minimum wage to $1.00 an hour.

see how

Superior or Atlas Engines

solve your **standby power** problems



Model 40 Superior Engine-Generator Set, an engineered installation, solves standby power problems of an Ohio company.

Engineered installations of Superior and Atlas Diesel, dual fuel and gas engine-generator sets have solved hundreds of standby power problems! In many cases they've paid for themselves. Their automatic start and stop operation often averts tragic consequences, by providing efficient, dependable power for essential plant services in every instance of main power source failures. In order for you to have all the facts and figures we've prepared a special case history file. It shows many instances of how our skilled engineers assisted in solving serious problems involving special considerations and peculiarities in individual installations. Chances are many of the installations will be similar to yours. This information will prove a valuable aid in your planning.

Write, on your letterhead, requesting this file of helpful examples. White's skilled engineers, with years of experience in developing engineered installations of Superior or Atlas engine-generator sets, will assist you in engineering the proper standby power for your specific requirements.

WHITE DIESEL ENGINE DIVISION

THE WHITE MOTOR COMPANY • *Plant and General Offices: Springfield, Ohio*

Superior ENGINES · ATLAS Imperial DIESEL ENGINES · White DIESEL

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N. C. Company Requests Increase in Rates

Oldtown Telephone System, Inc., Winston-Salem, asked the North Carolina Utilities Commission for permission to increase its rates to bring in an additional $15,605.88 annually.

The company, which serves Oldtown, King, Lewisville and Rural Hall in Forsyth County, said that its existing rates, in effect since July 23, 1952, are inadequate to produce a fair rate of return on its investment and that the increase is "reasonably necessary to insure the provision of adequate and efficient telephone service."

For the nine-month period which ended on Sept. 30, the company had total operating revenues of $106,306 and total operating expenses of $106,-105.02, leaving a net operating income of only $200.98, it told the commission.

Under its proposed rate schedule for residence service, one-party would be increased from $5.50 to $7.00; two-party service from $4.75 to $5.75; four-party from $4.25 to $4.75, and multi-party from $4.25 to $4.50. Business rates would be increased as follows: One-party, $10.75 to $12; two-party, $9.95 to $10; four-party, $8.00 to $8.50, and multi-party, $5.50 to $7.50.

1956 Convention Calendar

Association	*Date*	*City*	*Hotel*
Louisiana	Feb. 8 and 9	New Orleans	Jung
Minnesota	Feb. 13, 14 and 15	St. Paul	St. Paul
Kentucky	Mar. 6	Lexington	Phoenix
Texas	Mar. 12 and 13	Dallas	Baker
Ohio	Mar. 27 and 28	Columbus	Deshler Hilton
Nebraska	Apr. 3 and 4	Omaha	Paxton
Iowa	Apr. 10 and 11	Des Moines	Fort Des Moines
Indiana	May 9 and 10	Indianapolis	Claypool
Illinois	May 16 and 17	Peoria	Pere Marquette
Wisconsin	May 16 and 17	Madison	Loraine
Pennsylvania	May 22 and 23	Bedford	Bedford Springs
Washington-Oregon*	May 31 and June 1 and 2	Portland, Ore.	Multnomah
Kansas-Missouri*	June 4 and 5	Kansas City, Mo.	Muehlebach
California	June 6, 7 and 8	San Francisco	Fairmont
New York	June 11, 12 and 13	Schroon Lake	Scaroon Manor
Michigan	Sept. 6 and 7	Grand Rapids	Pantlind
Arkansas	Sept. 17 and 18	Hot Springs	Arlington
Rocky Mountain	Sept. 20 and 21	Salt Lake City, Utah	Utah
USITA (Annual convention)	Oct. 15, 16 and 17	Chicago	Conrad Hilton
Virginia-West Virginia*	Nov. 1 and 2	Roanoke	Roanoke
Alabama-Mississippi*	Nov. 12 and 13	(unannounced)	(unannounced)

*Joint convention

Arkansas Independent Asks OK to Make Bank Loan

The Arkansas Telephone Co., Inc., Clinton, in an application filed recently with the Arkansas Public Service Commission, announced plans to convert its exchanges at Clinton and Shirley to automatic operation.

The plans were outlined in the company's request for authority to borrow $105,000 from a St. Louis bank to finance the construction.

The application said the total construction cost would be $109,600.

Denver Housewife Claims Injuries from Telephone

When she said "Hello," the telephone fell off the wall and struck her, Mrs. Shirley Reibscheid, a Denver, Colo., housewife said on Dec. 31 in a suit for $56,448 damages.

She said she was confined to a bed for 14 days with a broken nose, concussion and other injuries. Defendants are the Mountain States Telephone & Telegraph Co. and the Denver department store in which the paystation was located.

Asks Dial Service Rates

The West Florida Telephone Co., Marianna, on Jan. 4 was to have had a hearing on its application to the Florida Railroad & Public Utilities Commission for authority to effect, on a one-year trial basis, a schedule of rates for dial service.

New Jersey Governor Signs Emergency Party Line Bill

Gov. Robert B. Meyner on Dec. 27 signed into law a bill making it illegal to hang on to a telephone party line when somebody else wants to make an emergency call.

Mr. Meyner originally sent the bill back to the legislature with a conditional veto. He recommended easing the penalties provided. Otherwise, he said, juries might be loathe to convict.

The legislature adopted his recommendations and the bill now provides a penalty of up to a year in jail and $1,000 fine. Originally, it provided for three years in jail.

The law requires that all telephone directories printed after Jan. 1 contain a warning of the statute, and defines as emergency calls those "relative to the protection of human life or property when the summoning of aid is essential."

To Vote on Kansas Merger

Jan. 9 was the date set for stockholders of the Garfield (Kan.) Mutual Telephone Co. to vote on merging the company with the Lewis (Kan.) Telephone Co.

REA 1955 Telephone Loans Totaled $66,808,000

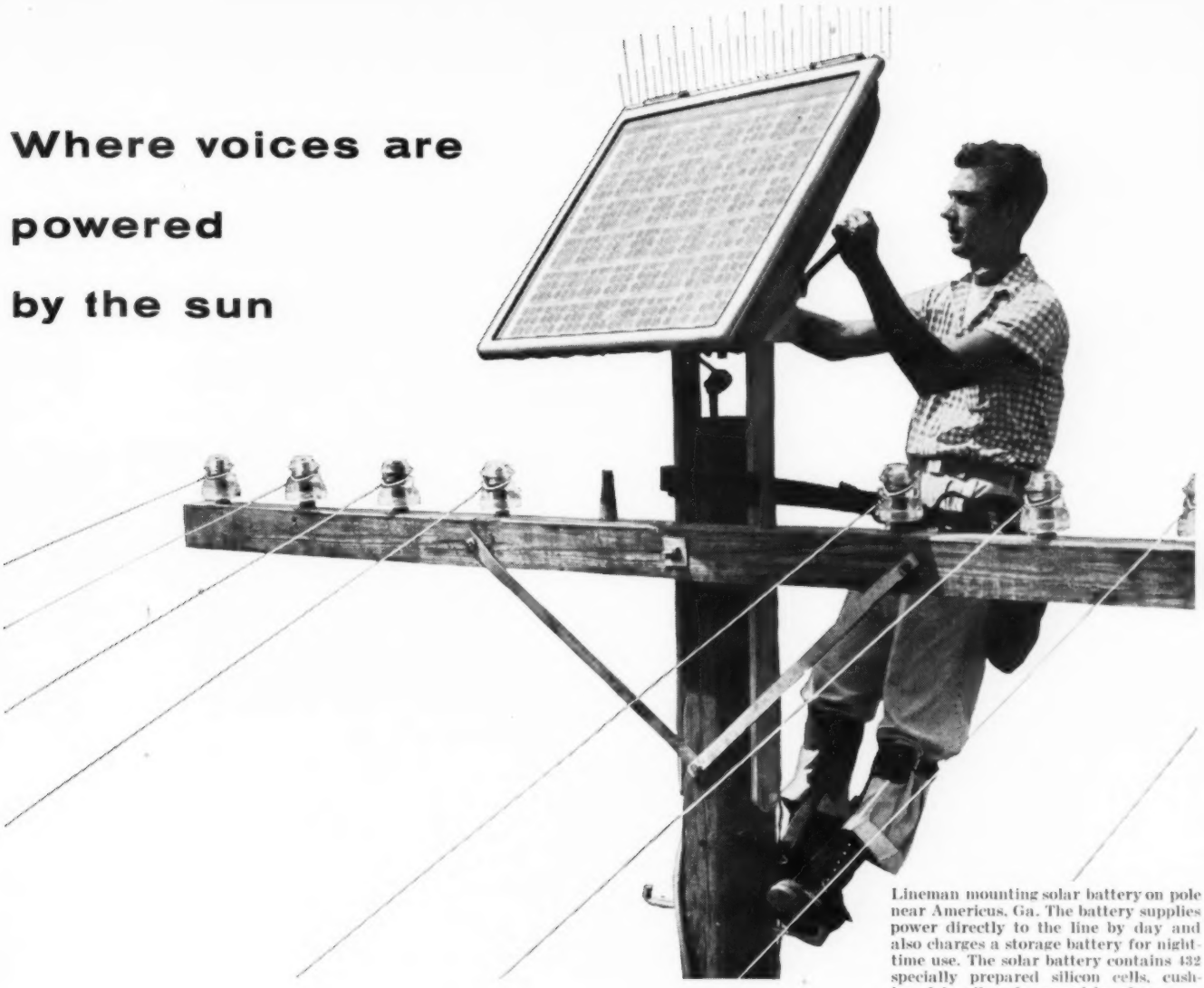
During the year 1955 the REA made 188 telephone loans amounting to $66,-808,000. Ninety-nine of the loans were made to new borrowers which had not previously used REA financing.

In 1954 REA made 147 telephone loans amounting to $66,346,000. Seventy-seven of these were to new borrowers.

Telephone loans during the last half of 1955 made up nearly two-thirds of the total for the year. One hundred and six loans for $40,073,000 were made during this period. Applications for additional loans which came to REA during this same period indicate a sustained loan level of approximately 80 million dollars in the telephone program for the fiscal year which ends June 30, 1956.

Total net loans since the start of the REA rural telephone program in October 1949 stand at 273 million dollars. They provide new or improved service to about 600,000 subscribers. Close to 125 million dollars has been advanced to borrowers who have completed more than 50,000 miles of new telephone line and about 650 modern automatic exchanges.

Where voices are powered by the sun

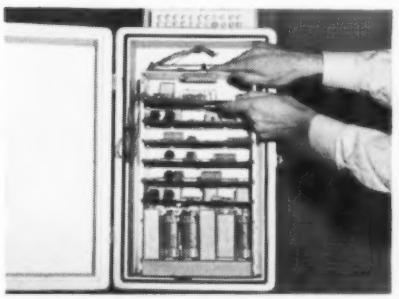


Lineman mounting solar battery on pole near Americus, Ga. The battery supplies power directly to the line by day and also charges a storage battery for night-time use. The solar battery contains 432 specially prepared silicon cells, cushioned in oil and covered by glass.

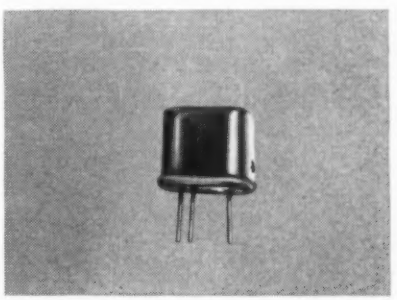
A new kind of telephone system developed by Bell Telephone Laboratories for rural areas is being operated experimentally by electric current derived from sunlight. Electric current is generated as sunlight falls on the Bell Solar Battery, which a lineman is seen adjusting in position.

The exciting achievement is made possible by two Laboratories inventions—the solar battery and the transistor. The new system uses transistors to the complete exclusion of electron tubes. Transistors require little power and this power can be easily supplied by the solar battery.

Compact and economical, the transistorized system can carry several voices simultaneously without interference. It has proved its ruggedness by standing up to heat, cold, rain and lightning. It promises more and improved telephone service for rural areas and it typifies the Laboratories' continuing efforts to make American telephony still better each year.



In sending and receiving terminals, transistors are used as oscillators, amplifiers and regulators, and for signaling.



One of the transistors (actual size) used in the new system. New ideas, new tools, new equipment and new methods had to be developed for this project.

BELL TELEPHONE LABORATORIES

IMPROVING AMERICA'S TELEPHONE SERVICE PROVIDES CAREERS
FOR CREATIVE MEN IN SCIENTIFIC AND TECHNICAL FIELDS

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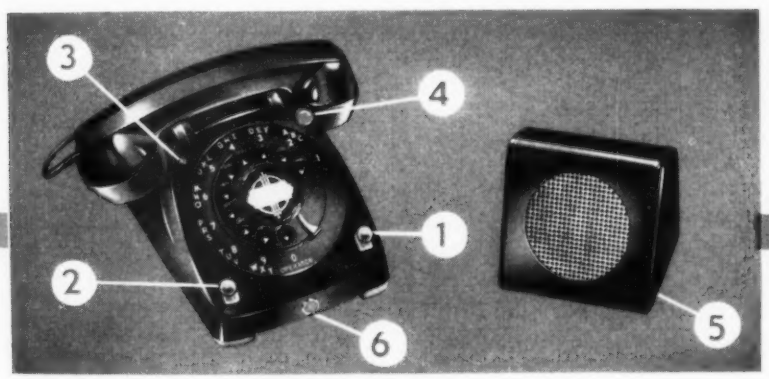
Automatic's Loud-Speaking Telephone offers the popular new convenience of "hands-free" telephoning. It saves time, saves temper, speeds work-flow... and it's marvelous for conferences! Here's a new-revenue opportunity you can't afford to pass up.

AUTOMATIC ELECTRIC

ORIGINATORS OF THE DIAL TELEPHONE

think of the REVENUE OPPORTUNITIES in a telephone like THIS



SO EASY TO USE:

To make a call, subscriber presses "on" button (1) and dials number; to end conversation (or if call is not answered), he presses "off" button (2). Signal light (3) glows until "off" button is pressed. To receive a call, he merely presses "on" button and talks. Volume controlled by knob (4).

NO BULK ON DESK! Only a *standard-size* telephone and a compact speaker (5) are on top of the desk. The control unit mounts under the desk—out of the way.

NO MICROPHONE TO PASS AROUND! Microphone (6) in telephone base is non-directional. You can talk in a normal voice from any direction.

EASY-TO-INSTALL "PACKAGE": The Type 88 Loud-Speaking Telephone comes completely assembled with speaker, control unit, and terminal block. Installation can be completed in 15 minutes.

This free folder will help you sell it!

Here's a brand-new folder that makes it easy for you to promote Automatic's Loud-Speaking Telephone. Written so subscribers can understand it, it tells all about the advantages of "hands-free" telephoning—explains how to use the Loud-Speaking Telephone—suggests where to find your best prospects. Write for a supply of this helpful sales-aid today—it's free! Give a copy to each of your commercial representatives and mail the rest out to prospects. Address: *Automatic Electric Sales Corporation, 1033 W. Van Buren St., Chicago 7. Or call HAymarket 1-4300.*

Order a Loud-Speaking Telephone for your business office. Let subscribers try it—and they'll want it.

XUM

LEFT PHOTO: Walter Smith, veteran of 34 years of service with the Rhinelander (Wis.) Telephone Co., completes installation of its 5000th telephone, while Joseph C. Cooper, plant superintendent; W. W. Boettcher, president of the chamber of commerce, and Allan C. Brown, company president, look on. RIGHT PHOTO: Paul R. Parsons, the Rhinelander company's general manager, holds the instrument, while Mrs. Donald Mangerson completes the first call from Rhinelander's 5000th installation. She spoke to her brother in Bend, Ore.

Rhinelander (Wis.) Company Installs 5,000th Telephone

The Rhinelander (Wis.) Telephone Co. installed its 5000th telephone recently, bringing its station total to the highest point in the company's history. When the company initiated operations on Apr. 4, 1901, as the Rhinelander Mutual Telephone Co., it served but 296 subscribers.

Ceremonies accompanying the event were treated in the local daily press and by radio station WOBT.

The 5000th station, a mist-green instrument, which matched the décor of the home in which it was installed, was placed in service for Mr. and Mrs. Donald Mangerson, who live in a new residential area of the city. Walter Smith, a 34-year veteran employe with the company, made the installation under the supervision of Joseph C. Cooper, plant superintendent. Paul R. Parsons, general manager, handed the telephone to Mrs. Mangerson for her first call while the company president, Allan C. Brown; the president of the Rhinelander Chamber of Commerce, W. W. Boettcher, and Secretary Ray J. Riordan of the Wisconsin State Telephone Association, viewed the proceedings.

Ranking ninth in size among telephone companies serving Wisconsin, Rhinelander has shown a net gain of 204 telephones since Jan. 1, 1955 this year. In the past five years it has made capital expenditures of $565,000, and by June of 1956, will have over 1½ million dollars invested in plant and property.

Presently the company is in the process of converting its exchange to automatic operation.

Completes Negotiations to Buy Two Kansas Companies

Negotiations for purchase of two additional exchanges in Harvey and Edwards counties in Kansas have been completed by Howard Culbertson, owner of Sterling (Kan.) Telephone Co., it was reported on Dec. 23.

Latest deal worked out by Mr. Culbertson was the one involving Hesston Rural Telephone Co., a mutual exchange with about 425 subscribers.

Acquisition arrangements with the 300-subscriber Belpre Telephone Co. had been completed a few days earlier.

This brings the Culbertson telephone holdings to eight exchanges in a little over two years from the date he started with purchase of the Sterling-Alden exchange.

Recommends Sale in Kansas

Examiner Annie N. Hutting of the Federal Communications Commission on Jan. 4 recommended that Southwestern Bell Telephone Co. be permitted to buy the Berryton (Kan.) Telephone Co. The Berryton company is being operated by a receiver.

Requests Rate Raise in Wis.

The Wisconsin Public Service Commission on Jan. 10 was to hear the application of the Mosinee Telephone Co. for authority to increase rates.

To Buy Two Service Lines

The Minnesota Railroad & Warehouse Commission on Jan. 3 authorized the Hancock Telephone Co. to purchase the Rural Service Station Line #15, serving two stations, and Rural Service Station Line #26, serving seven stations.

Dr. Kelly, Bell Labs, Given Swedish Scientific Honor

Dr. Mervin J. Kelly, president of Bell Telephone Laboratories, Inc., has been elected a Foreign Member of the Swedish Royal Academy of Sciences, one of the world's foremost learned societies.

The Swedish Royal Academy of Sciences was founded in 1739 by Carl Linnaeus and others for the encouragement of the natural sciences and mathematics. It awards two of the prizes of the Nobel Foundation, the prizes in chemistry and physics.

The academy, which is associated with a number of Swedish museums, carries out its work mostly through scientific institutions, publication of scientific pamphlets, and in providing funds to outstanding scientists and authors.

Dr. Kelly is one of 108 foreign members from countries outside Sweden. This number is constant. Swedish membership consists of a maximum of 140 and a minimum of 108 members.

Source of Capital

"[Capital for industrial expansion] cannot be transferred from one pocket to another by a beneficent government. Capital must be produced [and] multiplied by competitive enterprise."—CLIFFORD F. HOOD, *president, United States Steel Corp.*

Standard one-position sections are available for Stromberg-Carlson No. 3 type board, to permit easy expansion at least investment. This board has many other design advantages, including individually removable jack sleeves, keysender operation, provision for operator toll dialing.

This toll board grows a little at a time

. . . to save you money!

Toll business continues its merry dance upward.

That's fine. Your earnings continue to grow, too.

But how do you plan for the future? Buy a toll switchboard larger than you need today? Or a smaller board, and add positions when you need them?

We recommend the latter, because it prevents tying up your money on equipment you're not using.

And we recommend the Stromberg-Carlson No. 3 toll board, because you can expand it *one position at a time*, continuing to give your subscribers the finest toll service while paying only for equipment that you are currently using.

This is just one of the many financial reasons for buying a Stromberg-Carlson No. 3 switchboard. For details on maintenance economy, faster operation, etc., call your Stromberg-Carlson office.

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- **25 years young**
- **In the (sq.) groove**
- **Splice in a trice**
- **Power plus for PBX**

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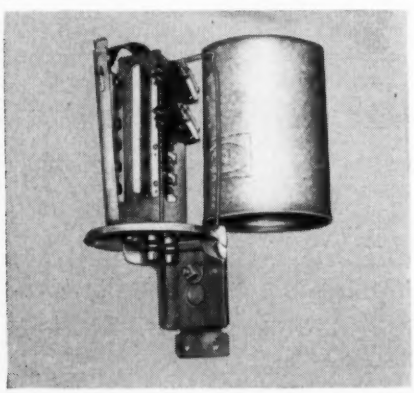
by C. J. Reynolds, Stromberg-Carlson Company

The few dollars you spend on *reliable* equipment today will be repaid a hundredfold in lower maintenance costs for years to come. Protect your investment with the double guarantee offered by Stromberg-Carlson. First, leading manufacturers build this equipment, and guarantee it. Second, because we recommend and sell this equipment to the telephone industry, we *also* guarantee its performance!

Versatile terminal for plastic cable installations

If you're installing plastic cable, you'll want the S-20V pole cable terminal, with its two cable entrances, each of which is arranged to accommodate compression couplings ranging from 6 pair to 51 pair in size.

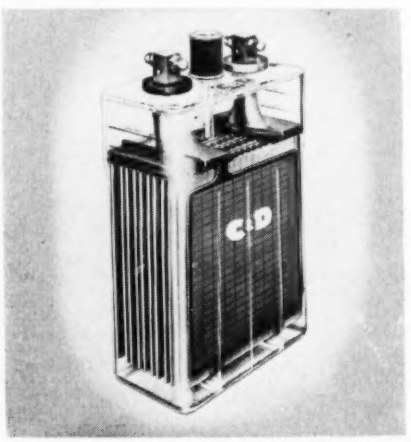


Easy accessibility of this pole cable terminal interior makes it ideal for use with plastic cable.

When only one cable entrance is required, you close the dead entrance with a standard pipe plug. These features, combined with the flexibility of Cook Electric Company's H-20 protector units, make the S-20V protected pole cable terminal probably the most versatile pole cable terminal available.

These two battery types give you decades of good service

Here's a dependable power supply for you with a life expectancy of **25 years!** It's the C & D PlastiCal telephone battery, and when we say it will last 25 years, we're thinking about **full float service.**



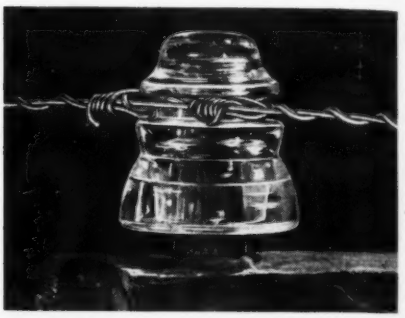
This low-cost PlastiCell battery has life expectancy of 14 years. Its PlastiCal counterpart will last you 25 years.

You get this extra-long life because C & D PlastiCal (lead-calcium grids) batteries have an exclusive suspended and supported plate construction.

If a 14-year life expectancy will fill your needs, C & D has an economical battery for that, too. It's the PlastiCell battery, using high-tensile lead alloy grids.

Use this insulator for rugged line construction

Hemingray Number 45 insulators with their square groove provide the ideal slot for your wire. Their reinforced construction under the groove reduces the possibility of breakage of the flange under the most severe ice loading conditions.



Double petticoat, square groove No. 45 insulator.

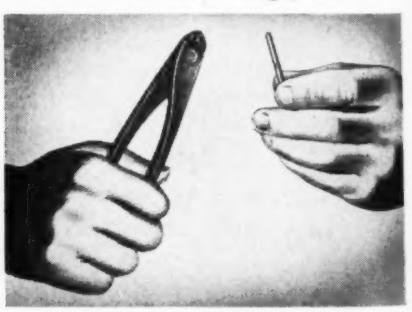
The extra long leakage path and double petticoat will reduce line losses and insure the strongest signal possible. These insulators are highly recommended for use on dial circuits where the strongest possible signal is necessary.

Hemingray insulators, the "World standard since 1870," are made by Kimble Glass Company, subsidiary of Owens-Illinois.

Splice it fast . . . and it *stays* fast

Here's how to make a quick splice that holds fast, even under the most intense vibration. In fact, your splice will outlast the conductor!

You need two items; a Nicopress sleeve, and the Nicopress tool that is designed especially for use with these sleeves. You simply butt the



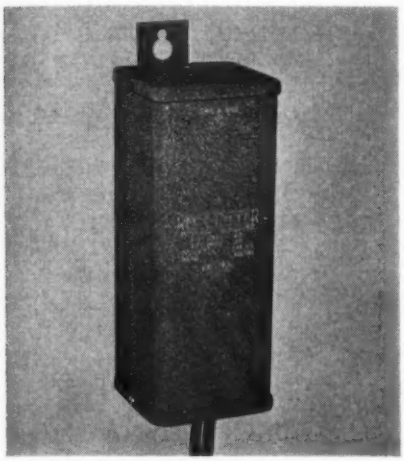
This Nicopress 17-2 tool plus this Nicopress sleeve make better pair splices, faster.

bared wire ends together inside the sleeve, and you've got a joint that won't ever pull out! Quick and easy.

The alloy lining inside the sleeve is harder than either the conductor or the sleeve, and forms a joint that is stronger than the rated breaking strength of the wire itself. And it has a high, lasting conductivity.

Keep your PBX customers happy with this dependable power unit

A steady, economical supply of DC power is one of the things you need for an efficient PBX—and a happy PBX customer. Here's how to provide that better service, with big savings.



Money-saving RectiFilteR®.
"Just plug it in and forget it!"

For more than two decades, leading independent telephone companies have found that Raytheon RectiFilteRs are the most economical and efficient way to supply steady DC power to PBX boards directly from an AC source.

With no moving parts, the Raytheon RectiFilteR requires neither adjustment nor maintenance. It will outlast many sets of batteries, release wires carrying charging current from central office to subscribers' PBX boards for revenue producing service, and minimize power cost because of high efficiency in converting from AC to DC.

Dry disc rectifying units and other components are designed for long-life, trouble-free service. The Raytheon RectiFilteR will end your telephone power problems.

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That New Look of Telephones

By G. W. MILLER*

A QUESTION being asked quite frequently these days is—"why has the telephone always been black?" Many of us can remember years ago, when purchasing a car, any color was available—just as long as it was black. The cars of today have come a long way, using one, two and three-color combinations, over the early cars.

In purchasing a car last spring, the salesman remarked that a black car today is almost a special order. However, no one believes that black telephones will follow this pattern, as long as the customers are obliged to pay extra for the colored installation. As the demand increases, there is the possibility of the manufacturer's cost leveling to the point of where the cost of the colored sets will be down to that of the black sets.

As the first step, the public has to be informed of the availability of the new sets, and, also, the colors. This can be accomplished in several ways, such as the use of enclosures with the monthly bill; the exhibition of all the colored sets in the business office, in stores and store windows; the installer, when placing the main station, telling the subscriber about the new instruments; and, finally, the local newspapers.

Some telephone companies are taking advantage of furniture store windows, furnished as rooms, in loaning a colored telephone of the proper shade to blend into the color scheme. A mannequin using the telephone will help greatly to call attention to it.

In many cities and communities, a contractor will show a model home, completely furnished, with the chance of showing a colored telephone. In one city, the telephone company worked with contractors on the "Parade of Homes" in the planning of proper telephone service for each, and most of the homes will have the colored telephones installed. These homes are decorated and furnished, and will be on display for a period of time.

In the design of the modern home, the architect and interior decorator are using more and brighter colors than ever before. A very pleasing sight, in a newly painted room, is a harmonizing colored set, rather than the conventional all black instrument. The colored sets available will harmonize with most any color used in decorating. An extension in a bedroom is an excellent location for a new set, giving that "homey" look to the room.

The use of the colored set is not limited to the home, but has a place in the office. With the recent introduction of the colored typewriter, the colored telephone will be very much in style. Offices are coming into their own, with brighter colors, which add to the beauty and efficiency of those people in there, and also make more pleasant surroundings. Furniture suppliers are taking notice of the new sets and are showing them in their display rooms. Office furniture is available in several colors, and there are colored telephones which will complement these colors and be very pleasing.

So far, this paper has mentioned the colored set without being too specific. There are really two kinds of colored sets on the market, the first ones available were known as the two-tone, and then, the full-colored set followed. The two-tone set is one with the colored housing and the black handset and cord. The colored set has the housing and handset all the same color. Each company should decide which type to offer.

Telephone people are all of the same opinion, in that the use of the new sets will increase as the public realizes their pleasing appearance.

*Mr. Miller is chief engineer of the Rochester (N. Y.) Telephone Corp. and is director of the USITA Sub-Committee on Central Office and Station Equipment. He prepared this paper for the Plant Conference of the recent USITA Convention.

Talented Executives Needed

"There is a very definite shortage of top executives in the United States today. Business and industry are expanding faster than staffs. There is a great need for new ways of discovering talented men, thus eliminating the increasing practice of raiding the staffs of other companies and luring executives away."—KENNETH R. JOHNSON, *sales vice president, Packard-Bell Co.*

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GREEK MICROWAVE

Concluded from page 19

suited to the needs of the Greek network than the concrete radio towers in common use in many other countries. During the earthquakes of August, 1953 and April, 1955, masts resting on four concrete blocks withstood the earth tremors to a remarkable degree.

Parnis Station

The Parnis station, just north of Athens, is the core of the Greek radio-telephone network. It receives from Athens three links in parallel, serving Salonica, Crete, and the Archipelago. It beams signals of the first of these links north to the Chlomon relay station, and the other two, southeast to the Keos relay station, and ultimately to Crete and the Aegean Islands.

When the master plan for the Greek network was drawn up, no statistics were available for accurately predicting the successful operation of a microwave link over a long stretch of open water, with a small degree of interruption. Over such a span, in fact, it was reasonable to expect fading due to the reception of a direct beam and a beam reflected from the surface of the sea or from some other obstacle.

Thus, the link established between Santorin and Heraklion, approximately 112 miles away on the island of Crete, constitutes a remarkable achievement. Since it was placed in operation a year ago, its performance has been comparable to that of a land cable.

The island chain stretching from north to south along the east coast of the Aegean Sea has always played an important role in the history and economy of Greece. Today, Lesbos, Chios, Samos, Rhodes, as well as smaller intermediate islands, are linked to Athens by four independent groups of telephone and telegraph circuits that comprise the Aegean network.

In February, 1954, just prior to the end of the IT&T-Greek contract, 94,295 lines of local telephone equipment (87,620 automatic and 6,675 manual) were in service as compared with 65,296 in service as of Dec. 31, 1950.

Comparative traffic figures also reflect the progress made in the rehabilitation program. For example, national long distance calls completed increased from 3,401,293 in 1950 to 4,400,000 in 1953; while international long distance calls increased from 10,854 to 63,000 over the same period.

Today, the Greek telecommunications system rivals that of the most up-to-date countries of the world; and its radio-telephone network, based on the far-flung areas it serves and its role in the national and European economy, is one of the most important.

IN THE NATION'S CAPITAL

Continued from page 21

people happy. It is another one of those things to watch in Washington.

The following state laws provide for regulatory commission jurisdiction over telephone cooperatives: Arizona, California, Delaware, Indiana, Kansas, Kentucky, Maryland, Michigan, New Hampshire, New Jersey, New York, Ohio, Virginia, West Virginia, and Wyoming.

In addition to these states, the commissions of still other states would have an opportunity to pass on proposed sales of privately owned telephone company properties to co-ops —not by virtue of any jurisdiction over the cooperatives, but by virtue of jurisdiction over attempted sales of properties by *privately* owned telephone companies. That apparently was the basis for the Illinois commission activity in the Payson Farmers Telephone Co.-Adams co-op case mentioned above. Alabama, Arkansas, Colorado, Connecticut, Idaho, Maine, Pennsylvania, Washington, and Wisconsin would also apparently be in this category. There may be one or two others.

In Massachusetts and Rhode Island the question is academic because there are no cooperatives in the utility business in those states. In Massachusetts, the commission, some years ago, did jump on a proposed REA co-op financing in the rural electric field, because the commission did not think the financing was sound. That apparently ended the rural co-op movement in Massachusetts.

Hush-a-Phone Ended

The old prize fighter's expression about being "saved by the bell" (no pun intended) might be applied, in some respects, to the seven-year-old case recently decided by the Federal Communications Commission. Just before the Christmas holidays, as widely reported in the press at the time, the FCC finally upheld the right of the Bell System to forbid the use of telephone attachments which are not officially authorized or approved. The ostensible target, of course, was the "Hush-a-Phone" device—a cup-like gadget attached to a telephone mouthpiece for the purpose of shutting out surrounding noise and providing privacy to the telephone talker.

These and other similar devices first came on the market during World War II. The telephone company began to brush up on their old rule about "foreign attachments" whenever the subject was brought up or came to their attention officially. And in 1948, the Hush-

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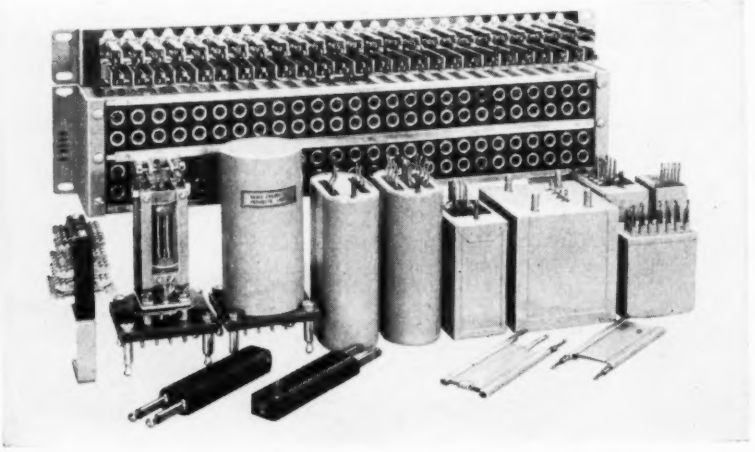

Radio Engineering Products produces a wide range of standard components for use in communication systems. In most cases these components can be delivered from stock.
FILTERS: Filters of advanced design are available for carrier telegraph, carrier telephone, and telemetering systems. These include channel filters, low-pass filters, and line filters.
JACKS and MOUNTINGS: Two standard 1¾" by 19" jack mountings are available. Type F6097A mounts 52 single jacks, and type F6097B 26 single jacks. Type F8410 jack is a double jack with parallel break contacts, interchangeable with type 410A.
REPEATING and RETARDATION COILS: A large number of standard types are carried in stock. These include voice-frequency and carrier-frequency line coils, hybrid coils, and retard coils for telephone and telegraph applications.

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a-Phone Corp. went to the mat with the Bell System by filing a complaint with the FCC, demanding that the telephone company permit the use of Hush-a-Phones.

The case has been kicking around ever since through various procedural stages. Telephone companies claimed that the Hush-a-Phone device has a tendency to interfere with service equipment in various ways, ranging from a loss of volume to a tendency to foul the proper seating of the telephone on the receiver cradle.

Back in 1951, an FCC hearing examiner agreed with the telephone company and wrote a tentative opinion holding that the Hush-a-Phone complaint ought to be dismissed. Now at long last, the FCC has agreed. But, meanwhile, something new has been added.

The commission's opinion notes that Bell System companies now offer to their telephone users push-button switches to exclude surrounding noise from telephone circuits. This, of course, is only one of a variety of new officially approved and sponsored telephone appliances — some going in the other direction, such as the device which makes it possible to push a button which turns an ordinary telephone into a loudspeaker, heard all over the room.

It would thus appear that there is no longer the pressing need—if indeed there ever was a pressing need—for an independently produced acoustical device to suppress background sounds during the use of a telephone. Telephone companies now have their *own* answer to the problem (for a consideration, of course). Hence, the slight innuendo in the commission's opinion that the industry's case for protecting the sanctity of the "foreign attachment" rule has been aided by subsequent developments, or "saved by the bell."

Obituary

ELLSWORTH B. OVERSHINER, 89, well-known pioneer in the Independent telephone industry, died on Jan. 7 in Chicago from injuries sustained in an automobile accident.

Forty years ago, Mr. Overshiner was president of the Swedish-American Telephone Mfg. Co., which was located in the Ravenswood district of Chicago. He was prominent in the early days when the United States Independent Telephone Association was challenging the Bell System for a place in the national telephone service, which eventually resulted in the division of territory existing today.

Mr. Overshiner was a figure at re-

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Now you can expand toll trunk facilities, carry 120 voice channels on a single circuit with a reliable, completely flexible system that requires a minimum of maintenance.

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Collins new 120 channel stacked carrier system, permits integration with open wire, cable or radio facilities. The modulation plan is compatable with standard telephone frequency assignments. You can coordinate the Collins system with all other high density carrier systems now employed in the domestic and the CCIF European Toll Plan. And, only normal testing and routine procedures used in these systems are required.

Engineered for simplicity, flexibility

Only twelve different channel units are used to form the base group. Five base groups are modulated to obtain the 60 channel super groups. Super group modulation is available as required. Multiple super groups may be used simultaneously. Circuits may be dropped or inserted at repeater points by bridging in either partial or complete groups. Interconnection in toll tandem arrangements may be easily performed.

Compact, modular construction

Compactness is achieved through the use of high-quality etched printed wiring, miniaturized components, and Collins exclusive Mechanical Filters which improve performance.

Easy maintenance

Test points are available at each module. Cathode activity of each tube is metered. Panels are fastened by articulated hinges, permitting back-to-back mounting and complete servicing of any shelf from one side of rack.

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cent Independent telephone conventions. He will be missed by many of the Pioneers in the Independent ranks.

As one of the early manufacturers in the telephone field, Mr. Overshiner was the inventor of several of the improvements which helped to make the service in the United States the leader in world telephony. His company installed many of the Independent telephone plants in Canada beginning with the plant at Quebec, and extending into the western Canadian provinces.

Employe Health Program Guide Offered by OHI

The Occupational Health Institute recently released its current OHI service bulletin, "Health and Employer/ee Efficiency," published by the institute as an educational activity to bring better understanding of industrial medical services and employe health care.

This bulletin has been distributed to managements throughout the country as a guide in planning, developing or expanding employe health programs. Companies complying with standards for medical service in industry set by the Industrial Medical Association will be certified by the institute and receive the OHI certificate of health maintenance.

For copies of the bulletin, write Occupational Health Institute, Inc., 6 E. 39th St., New York 16, N. Y.

General of the SW Announces Construction Program Plans

Plans for the largest construction program in the company's history have been announced for 1956 by W. G. Wright, president of General Telephone Co. of the Southwest, San Angelo, Tex.

The 1956 construction program calls for more than 8.7 million dollars in net additions to plant, which will bring total plant in service to approximately 60 million dollars by the end of 1956.

Mr. Wright said gross construction expenditures in 1956 will be 12.1 million dollars or an increase of 3.6 million dollars over 1955.

The increase is due primarily to eight automatic conversions, four automatic equipment replacements and three new exchanges to be established during 1956.

Thirty-five per cent of the construction budget is earmarked for outside plant, 28 per cent for central office equipment, 27 per cent for station equipment, and 10 per cent for land, buildings and general equipment.

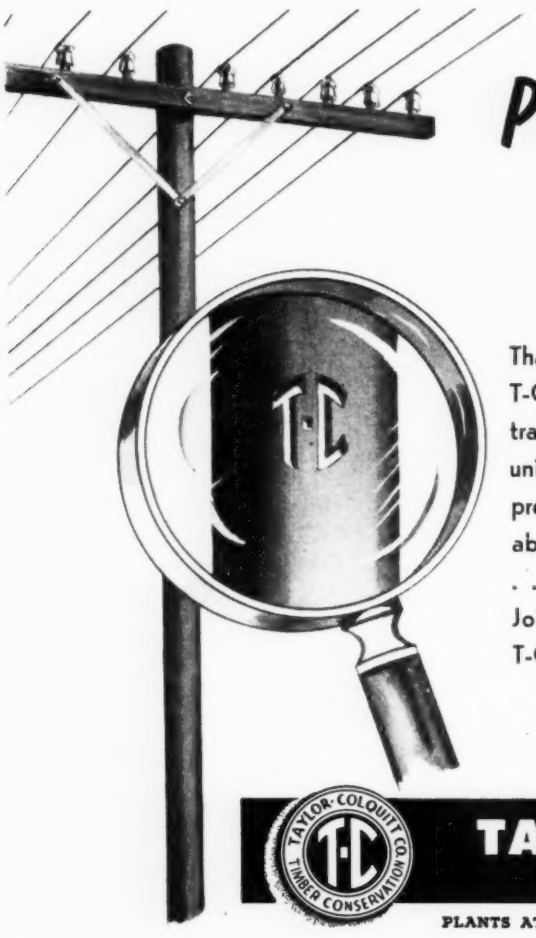
L. Sieckmeyer Plans to Join Shumway J. Bird & Co.

LeRoy Sieckmeyer, chief accountant of the Nebraska Railway Commission, has announced his resignation effective Feb. 1. He will be associated with Shumway J. Bird & Co., Springfield, Ill., an accounting firm. His work will deal with utility accounting and will consist primarily of supervision of bookkeeping for Independent telephone companies in Nebraska, Iowa, Kansas and part of Missouri.

Mr. Sieckmeyer joined the commission as a bookkeeper in 1944 and has headed the accounting division since 1952. He will continue to live at Lincoln, Neb. His successor has not been announced.

Results of Competition

"By accepting the challenge of individual competition we have done a better job of applying our human energy and individual initiative to the improvement of the welfare of all. This is why I am so sure that our free society is the best and will ultimately prevail in other lands when other peoples have the opportunity to develop in a similar pattern."—CHARLES E. WILSON, *Secretary of Defense.*



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That's what T-C pole users do. Here's why . . . they know that T-C's exclusive Vapor-Drying process permits more uniform penetration of creosote or penta. They know that this deeper, more uniform penetration enables Vapor-Dried poles to retain their preservative longer . . . thus making them the most durable available. They know they can install T-C poles . . . one or a thousand . . . and get long years of trouble free service from each one. Join the ever-growing list of telephone companies who specify T-C Vapor Dried poles and put 'em up and forget 'em.

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TAYLOR - COLQUITT CO.
SPARTANBURG, SOUTH CAROLINA

PLANTS AT SPARTANBURG, SOUTH CAROLINA AND WILMINGTON, NORTH CAROLINA

PLANT MAN'S NOTEBOOK

Concluded from page 23

requirement for wire and cable to provide the communication necessary for our armies in the field.

General O'Connell also indicated a need for a new type of long-range cable to replace our present Spiral-4. This cable should be of a type that may be laid from the air by airplanes or helicopters.

The incomparable Eddy Love, of Koiled Kord fame, did his usual outstanding job as master of ceremonies at the banquet. Eddy claims that he will be on a trip to the Philippines next year during the symposium and will not be available for these duties.

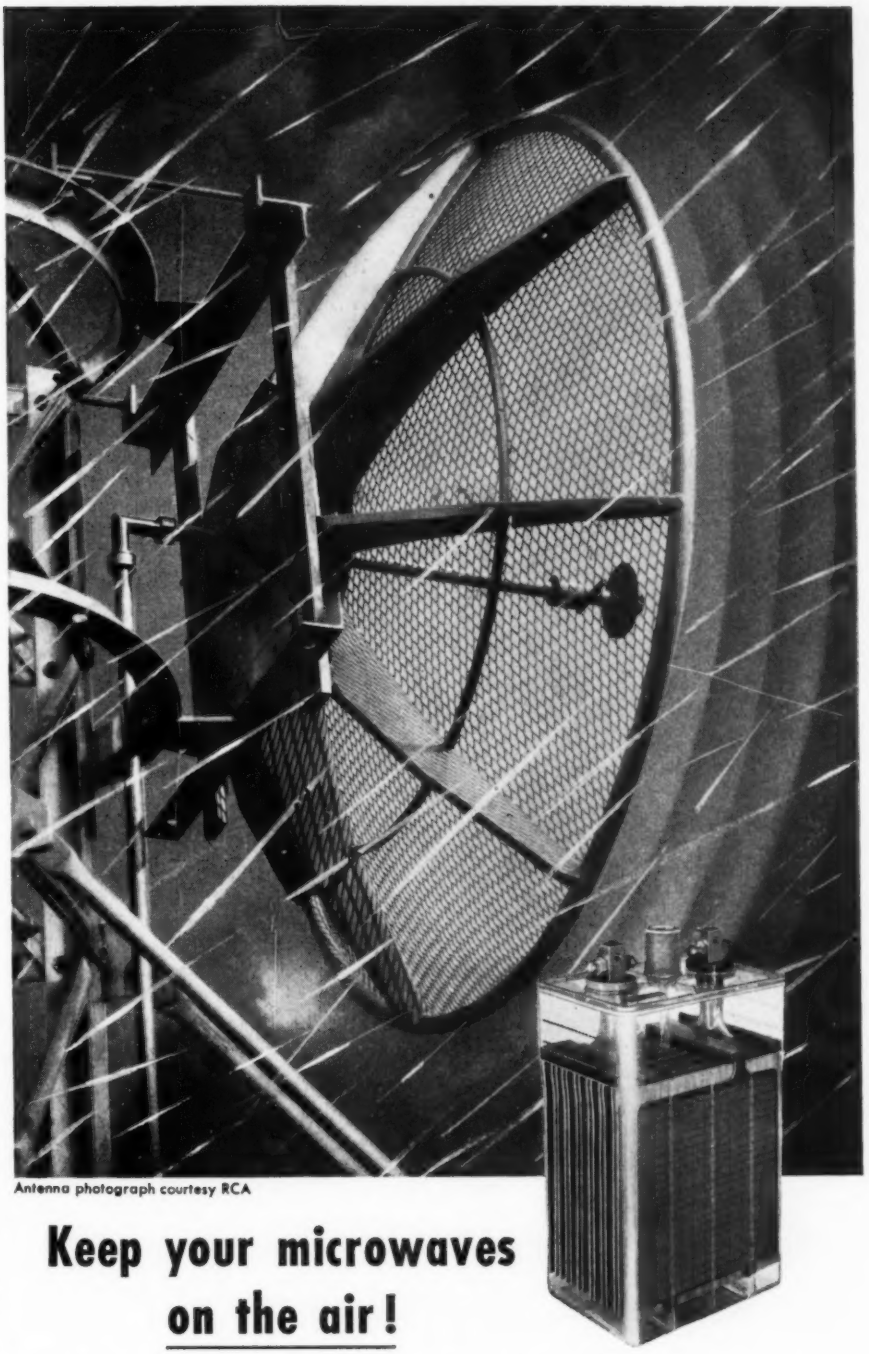
However, we understand that there is a movement already under way to draft him for these duties so that his trip to that pearl of the Orient must be rescheduled or cancelled.

This wire and cable symposium is to be an annual event. It is believed that many operating telephone companies would do well to consider having a representative present. The benefits will be great for anyone who has problems in connection with the provision of telephone service by wire and cable. These problems, we believe, are encountered by everyone in the telephone business.

Favorable Business Climate

"Jobs are created, and only honestly created in our free competitive price economy, by people using their money to expand existing business or start new ones in the hope of making a profit. If any government policy is such as to make a profit unlikely or very difficult, people simply are not going to launch the new ventures from which new jobs grow." — GEORGE M. HUMPHREY, *Secretary of the Treasury.*

"BY GOLLY, YOURE RIGHT."



Antenna photograph courtesy RCA

Keep your microwaves on the air!

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C & D Batteries are always ready to help keep your vital microwave system on the air, regardless of interruptions to normal power supply.
With C & D batteries standing by, you get—

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4. Long life—25 years with lead-calcium C & D PlastiCal.®

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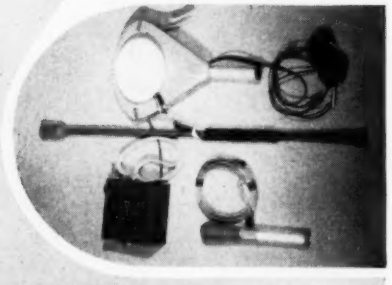
Patent No. 2142304—Pat. pending
*Reg. U. S. Trade Mark

- Locates shorts, crosses, grounds and opens in cable, drops and aerial wire without necessity of climbing poles.
- Cuts trouble shooting time and gas mileage.
- Identifies pairs in cable.
- Locates buried conduit, water and gas pipes.
- Locates concealed wiring between walls in building.



A TELO-CATER unit will save you many hours of line search for trouble spots. It is simple in design, easy to operate, and tone locates line faults exactly.

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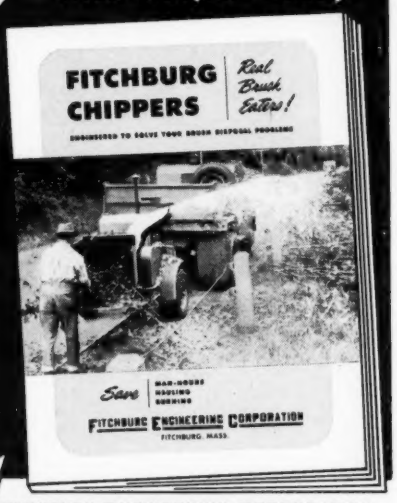

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TROUBLE CLEARING

Concluded from page 25

or those pliers when it happened was in great danger, especially if the flash was near his face.

Arcs or flashes in the battery room are usually caused by work operations which involve the use of metal tools. The copper bus-bars and other electrical conductors are often not insulated so that it is very easy to cause a short circuit with pliers or wrench.

Some companies now insulate the live bus-bars whenever possible by taping them. This is a good practice.

Before starting such work as tightening bus-bar bolts, cover all nearby current carrying parts and all grounded parts with rubber blankets. For the low voltages encountered in the battery room, dry canvas will also provide ample insulation but the canvas must be dry. *After having insulated all nearby conductors, proceed very cautiously with the work.*

Well, we have found quite a few possible causes of accidents in the battery room. Perhaps the reader can find others. After finding these potential causes let us keep them constantly in mind and take all practicable preventive measures. Then the battery room will be a safe place to work.

(To Be Continued)

Answers to Questions On Page 26

(1) Enter "not listed" in the space for reports and proceed with the call.

(2) Yes, this action should be taken.

(3) The outward operator should say for example, "I will connect my customer" and ask the calling party to speak with the operator.

(4) Give the report unless it is obvious that the customer understands it, clear the circuit, enter "NF (time)" in the space for reports, and release the calling line.

(5) Say, "All right, thank you," and clear the circuit unless the calling party volunteers directions which will require further use of the circuit. Give the report if necessary, saying "Mr. (called party) is not registered at (address name) (or no.). What time shall I try the call again?" and proceed as directed.

Here's Safer, Easier Reel Handling

●Here's the reel jack that is strong and stable without hard-to-handle extra weight. An aluminum alloy housing reduces overall weight by 21 pounds, yet maintains full 10-ton capacity. "T" shaped laminated oak base gives solid, safe foundation. Single acting mechanism provides easier operation. Handles reels to 84" dia.; weighs 83 lbs. Furnished with 5' lever bar.

Write for full data on Reel Jack No. A-1029 and other Simplex Utility Jacks.

Pole Pulling and Straightening Jacks—Save time, cut work crews necessary to pull, straighten or move poles. No. A-1538 has aluminum housing, 15-tons capacity, weighs 63 lbs.

All-Purpose Jack — No. 310A lifts, pulls, pushes at any angle. Four lift points. 15-tons capacity.

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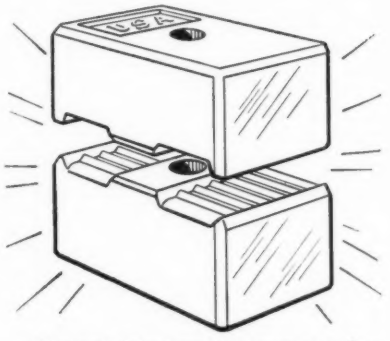

Made of highest quality dry-process electrical porcelain . . . Porcelain Products telephone insulators assure long, continuous service . . . customer satisfaction. Porcelain Products, Inc. has served the telephone industry for decades, offering a complete line of insulators that meet AT & T and REA specifications . . . simplifying installation . . . reducing maintenance. Write for complete information, today!

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Four Independents Cited For Excellent Management

Twenty-seven companies prominent in the telephone field—four of them Independent companies—have been certified as "excellently managed" by the American Institute of Management, it was announced on Jan. 6.

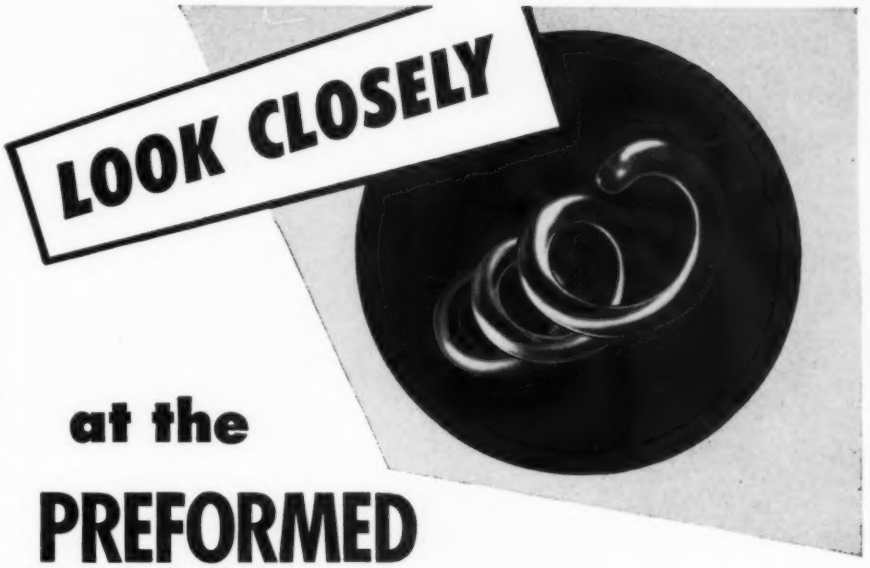
Those Independents named are: Carolina Telephone & Telegraph Co., Tarboro, N. C.; General Telephone Corp., New York, N. Y.; Hawaiian Telephone Co., Honolulu, T. H., and the Lycoming Telephone Co., Pine Grove, Pa.

Those in the Bell System named are: Southern Bell Telephone & Telegraph Co., Southern New England Telephone Co., Pacific Telephone and Telegraph Co., Northwestern Bell Telephone Co., Wisconsin Telephone Co., Ohio Bell Telephone Co., American Telephone and Telegraph Co., Indiana Bell Telephone Co., Illinois Bell Telephone Co., Southwestern Bell Telephone Co., Bell Telephone Co. of Canada, Bell Telephone Co. of Pennsylvania, New York Telephone Co., Mountain States Telephone and Telegraph Co., New England Telephone and Telegraph Co., New Jersey Bell Telephone Co., Chesapeake & Potomac Telephone Co. of Maryland, Chesapeake & Potomac Telephone Co. of Virginia, Diamond State Telephone Co., Michigan Bell Telephone Co., Chesapeake & Potomac Telephone Co. of Washington, D. C., Chesapeake & Potomac Telephone Co. of West Virginia, and Cincinnati & Suburban Bell Telephone Co.

The awards were announced by Jackson Martindell, president of the Institute, who said their purpose is to "bring deserved recognition to those companies whose managements are doing most to increase productivity, with accompanying benefits to employes, shareholders, their community neighbors, and to the economy as a whole."

Ten factors are employed in auditing a management, he explained, and a company must receive a minimum of 7,500 points in order to qualify as "excellently managed." Evaluations are based on the institute's continuing analysis of concerns in the United States and Canada. The factors referred to are: economic function, corporate structure, health of earnings, service to stockowners, directorate analysis, research and development, fiscal policies, production efficiency, sales vigor and executive evaluation.

The institute is a non-profit foundation devoted to the study and improvement of corporate organization and management. Its directors, in addition to Mr. Martindell, include: Ralph C. Davis, professor, Ohio State University; Alfons B. Landa, partner, Davies,



a major advance in line accessory fittings

The Preformed method of producing line accessories is an exclusive new development for the telephone industry. It incorporates the use of Preformed Rods—helically formed within exacting tolerances—to serve varied "fitting" functions all along the line. No more bolts—no compression tools—simplified construction. More than just something new, Preformed Products represent a better, faster and more economical way to *dead-end, splice, support,* or *protect* conductors and strands.

For more information on their exclusive advantages, consult your telephone distributor.

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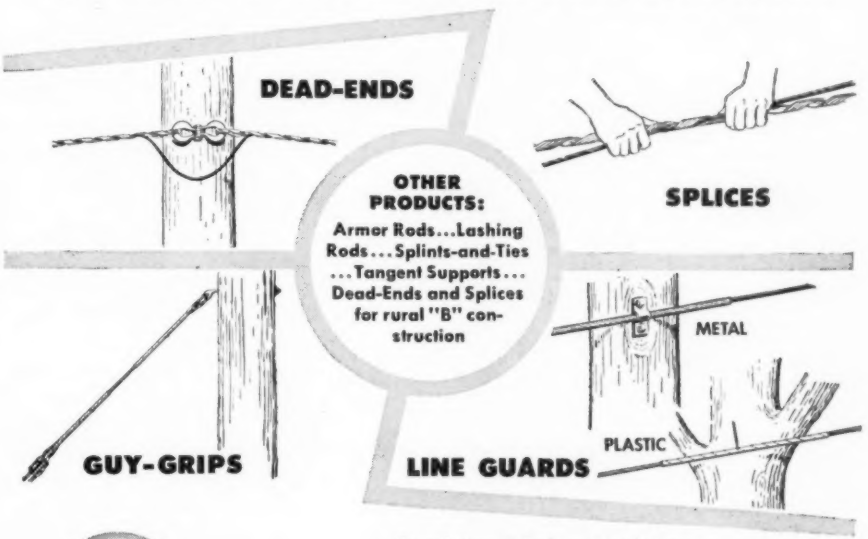

Consult Your Telephone Distributor

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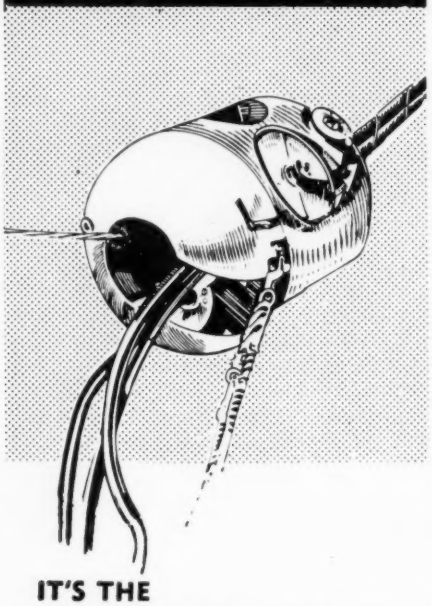

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Richberg, Tydings, Beebe & Landa; Chester C. Maxey, president, Whitman College; Peter Sammartino, president, Farleigh Dickinson College; Wheeler Sammons, publisher, "Who's Who in America"; Ordway Tead, editor and director, Harper & Brothers; Edward R. Weidlein, president, Mellon Institute of Industrial Research, and C. R. Whittlesey, professor, University of Pennsylvania.

The 408 companies which were given statements of management condition certifying to their excellence are listed in the foundation's yearly, "Manual of Excellent Managements," to be distributed in February to its 14,000 members and fellows. Copies are obtainable from headquarters of the institute, 125 E. 38th St., New York 16, N. Y.

Tells of Efforts to Place Extra Children's Telephones

Results of an intensive merchandising campaign by Illinois Bell Telephone Co. to increase installations of private telephones for children, were reported by the *Wall Street Journal* on Dec. 27, 1955. The *Journal* stated:

"Talkative teen-agers are ringing up new sales for telephone companies as more parents have private telephones installed for their children.

"A 'very substantial increase' in the number of children's telephone listings in the Chicago area is noted by Illinois Bell Telephone Co. as a result of an intensive merchandising campaign. Though no separate statistics are kept, the company estimates about 500 youth telephones have been installed since their debut after World War II.

"Not extensions, the telephones have their own private lines, numbers and bills—which parents usually pay. Chicago directories list them under parents' names as 'child's telephone' or 'son's' or 'daughter's.' In many cities, such as New York, the listings must be under the child's name. The New York Telephone Co. agrees that kids' telephones, while only a small per cent of total telephones, are growing in number.

" 'It's all part of the trend to streamlined, modern living, like having two cars,' says one Illinois Bell official. 'It's parents with gabby kids acting in self-defense,' confides another Bell man, out of earshot of his colleague.

"Dial (a certain number) in Chicago and you will get Emmet F. Byrne, an attorney, or his wife. Dial (a different number) and you will get the same residence but one of the five Byrne children at home will answer.

" 'The children's telephone is a necessity, not a luxury,' avers Mrs. Byrne. 'When we got it we had all eight kids at home with four in high school. You can imagine — it was impossible to make a call. We tried putting the telephone on the stair landing so they would be uncomfortable while talking, but it didn't work. Now things are going smoothly. The kids even have an extension on their telephone."

" 'We put our daughter's telephone in for self-protection,' says Mrs. Herbert H. Engelhard, wife of a Skokie, Ill., doctor. 'Without it the hospitals and patients would have a tough time reaching the doctor at times. We put it in when we had three children at home, but it still gets plenty of use from our daughter. . . .'

"Some families get so used to having the second telephone they keep it after the children have grown up and left home. 'It's a big convenience and we think it would be a lot of trouble to take it out,' says Mrs. Maurice E. Paradise, whose husband is vice president and general manager of National Fabricated Products, a division of Hoffman Electronics Corp. The two Paradise children no longer live with their parents.

"How do the kids like it? 'It's super,' exclaims Susanna Knox, who shares her Crystal Lake, Ill., telephone with two brothers and a sister. 'We tell our friends to call our number so now we never tie up the folks' telephone. Of course, we still argue about which of us uses it the most.' A minor danger: The kids have been known to slip in an occasional long distance call, says their mother, Mrs. Vernon J. Knox.

"Kids' telephones are found most often in families where the breadwinner needs the telephone for after-hours business reasons. Eugene Goodman, a Highland Park, Ill., contractor, gave his daughter telephone service as a graduation gift. 'She was thrilled,' says Mrs. Goodman, 'and so was my husband. Now he's able to talk business with subcontractors and architects again. It's well worth the $5.75 a month it costs.'

"A spot check of Chicago and suburban directories indicates most telephones for youngsters are located in the homes of doctors, lawyers and business executives. . . .

"Illinois Bell says it is pushing telephones for the younger set as part of its merchandising campaign, not just as a conversation piece. This campaign, incidentally, resulted in 78,000 extension telephones being installed in the firm's area this year, compared with 27,000 in 1954. There's one extension telephone for every six residential telephones in Illinois Bell territory

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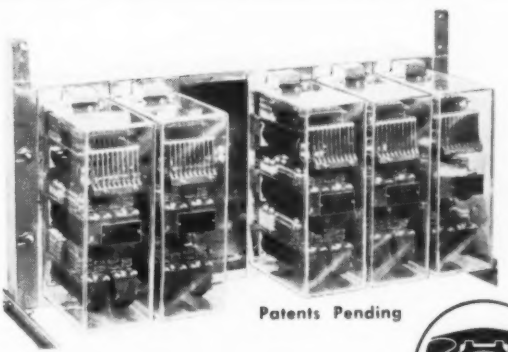

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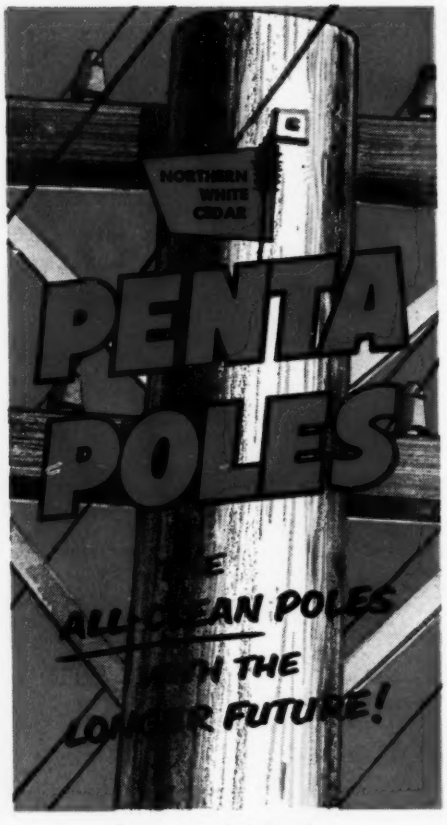

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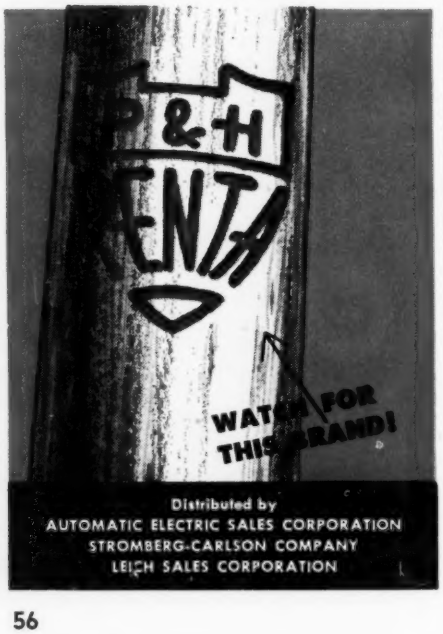

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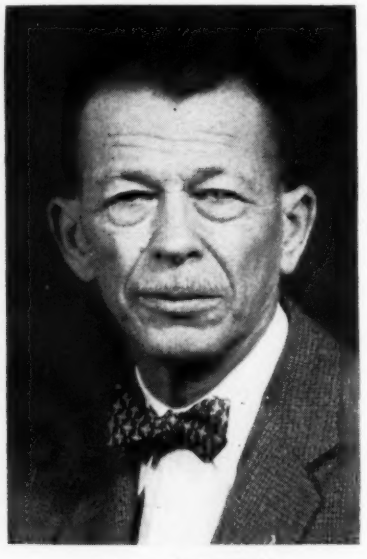
now. And color telephones are being installed at the rate of 165,000 a year in the Chicago area, compared with 27,000 last year.

"Illinois Bell, which long has listed numbers for people's tennis courts, garages, stables, gate houses and servants' quarters, thinks it spots a good thing in kids' telephones. . . ."

AE's Griffins Receives Talbot G. Martin Award

Morris E. Griffins, engineer in charge of circuit standards for Automatic Electric Co., is the 1955 recipient of the Talbot G. Martin award.



M. E. GRIFFINS

The honor is bestowed by the Strowger Automatic Club on the member of the organization who is judged by an award committee to have made outstanding contributions to the art of communication.

The presentation to Mr. Griffins was made at a banquet held in December and was based on his broad knowledge of circuitry in all phases of the automatic telephone art and his ability to communicate this knowledge to telephone company personnel.

Mr. Griffins joined Automatic Electric in 1920 after study at the University of California and service in the field artillery in World War I.

His first duty with the company was to assist with installation activities in Cuba, followed by assignment on leave to the Western Electric Co. which was then beginning to install Strowger automatic equipment for the Bell System.

Mr. Griffins returned to Automatic Electric in 1924 and, in the words of Leonard L. Ruggles, chief telephone engineer of the company, who made the speech of presentation, ". . . from that time on began making his influence felt in equipment and circuit design, manual engineering, circuit standards and circuit adaptation. He has been a development consultant and has contributed five inventions in his own name and nine in which he was co-inventor. His uncanny memory for circuits and combination of circuits which will work together in complete harmony to produce reliable and complete telephone service, has led to this award."

The citation follows:

"To Morris E. Griffins, whose encyclopedic knowledge of telephone circuitry and its application is widely recognized, and whose guidance and assistance to telephone company operating personnel has contributed greatly to the continuing success of Strowger Automatic equipment."

John B. Renwick Elected To Controllers Institute

John B. Renwick, vice president, Telephone Services, Inc., Chicago, has been elected to membership in the Controllers Institute of America.

Established in 1931, the institute is a non-profit management organization of controllers and finance officers from all lines of business—banking, manufacturing, distribution, utilities, transportation, etc. The total membership exceeds 4,400.

North Names P. E. Ekstrand Sales Representative

Paul E. Ekstrand will represent North Electric Co. sales in Iowa and Nebraska, according to an announcement by D. F. Snyder, sales manager, for the North telephone division.

P. E. EKSTRAND

Mr. Ekstrand has been manager of the Gardonville Telephone Association, Brandon, Minn., and later manager of Calvert (Ky.) Telephone System.

He will reside in Webster, Iowa.

Elect R. C. Tait Chairman, Buffalo Federal Reserve

Robert C. Tait, president of Stromberg-Carlson and a senior vice president of General Dynamics Corp., of which Stromberg-Carlson is a division, has been elected chairman of the board of the Buffalo branch of the Federal Reserve Bank of New York for 1956, according to an announcement issued by Arthur H. Willis, secretary.

Mr. Tait has been a member of the bank's board since Jan. 1, 1951, and previously served as its chairman in 1953.

Un-American Movement

"This epidemic of un-American individuals, which is now plaguing us, started in Washington. Socialism never became a real menace in this country until it took root in our federal government. It came from the top to the bottom. Its leadership can be traced to a few institutions and a very few individuals. After the 'bloodless political and social revolution' got under way in government, it began to show in our schools and churches. The infiltration is deeper than most people realize."—DONALD J. COWLING, *Cofounder, Spiritual Mobilization (nondenominational organization working on government, social, and economic problems).*

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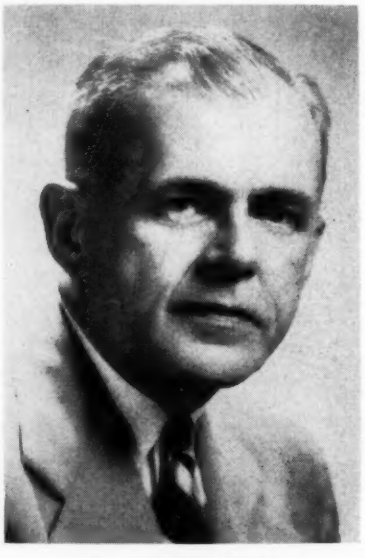
WASHINGTON — NEW YORK — KANSAS CITY

Line Material Co. Elects R. G. Wheaton President

Election of Rodgers G. Wheaton as president of Line Material Company to succeed William D. Kyle Jr., who resigned, was announced on Dec. 20 by Max McGraw, president, McGraw Electric Co., Chicago, of which Line Material is a division.

At the same time, Mr. Wheaton announced the appointment of Sales Manager Earle W. Williams as vice president in charge of marketing and sales, Wheaton's former position.



R. G. WHEATON

In making his resignation, Mr. Kyle announced his plans to enter the fibre pipe and conduit business.

Wheaton, who has been a vice president since 1952, joined Line Material in 1933. He served successively as field engineer, ordnance engineer, division manager, manager of government contracts department and sales manager before becoming an officer of the company. He was born in Springfield, Mass., in 1902, attended the University of Maine for two years, graduated from the University of Idaho with a B.S. degree in 1924, then went on to Yale University, where he received a master's degree in 1925.

E. W. WILLIAMS

Mr. Williams joined Line Material in 1937 following his graduation from the State University of Iowa where he received a B.S. in Electrical Engineering. He started as a field engineer, then became assistant sales manager and sales manager at the firm's Kyle plant in South Milwaukee. He was later transferred to the headquarters office in Milwaukee to serve as sales promotion manager and finally sales manager.

Before joining Line Material, Kyle was associated with Wisconsin Electrical Power Co. for a year after graduating from Cornell University in 1936 with a B.S. degree in Administration and Electrical Engineering. He was born in Milwaukee in 1915.

Kyle succeeded his father, W. D. Kyle Sr., as president and general manager at the time Line Material became part of McGraw Electric Co. in 1949. Kyle Sr. founded the company in 1911.

For the time being, said Mr. McGraw, Kyle will remain at Line Material to assist Wheaton in assuming his new duties.

Kyle disclosed that search will begin immediately for a "strategically located plant site" for his new fibre products business. He expects production to begin in about a year.

Other business interests held by Kyle include: director, McGraw Electric Co., First Wisconsin National Bank, Milwaukee; Dumore Co., Racine; Electronic Secretary, Inc., Milwaukee; Marietta Engineering & Management Co., Milwaukee; Kearney & Trecker Corp., Milwaukee; president and treasurer, Optikyle, Inc., South Milwaukee.

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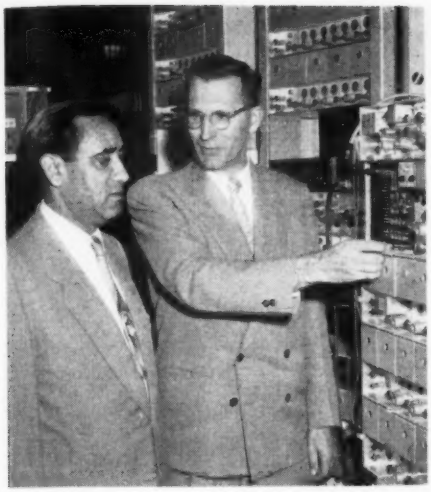

A recent visitor at Lenkurt Electric Co.'s San Carlos, Cal., plant was Krishan K. Malhotra (left), deputy director of telephones for India's Post, Telephone & Telegraph Dept., pictured here as he inspected wireline carrier equipment with W. C. Fisher, manager of the Lenkurt export division. Malhotra spent a week at San Carlos, studying carrier, radio design and production, and joining Independent company engineers in Lenkurt's technical training classes.

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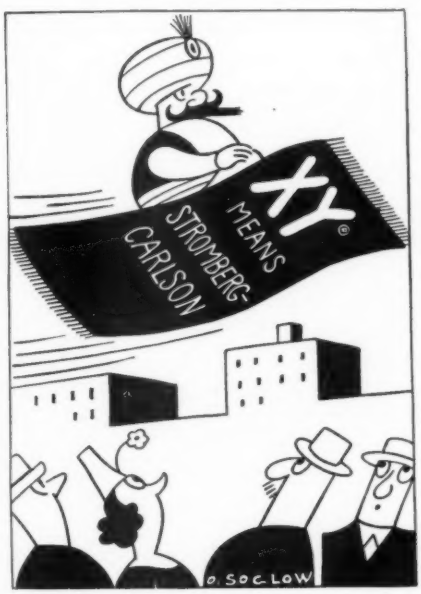

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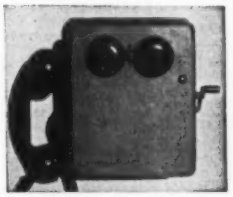

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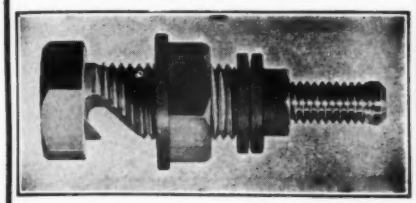

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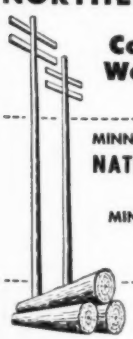

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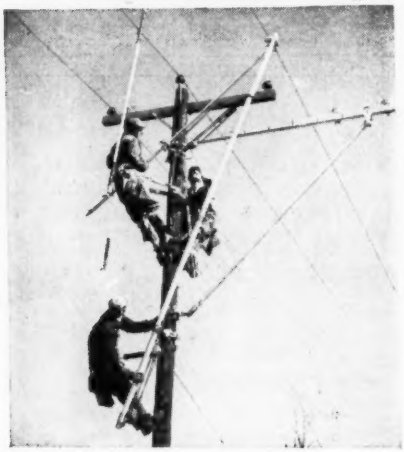

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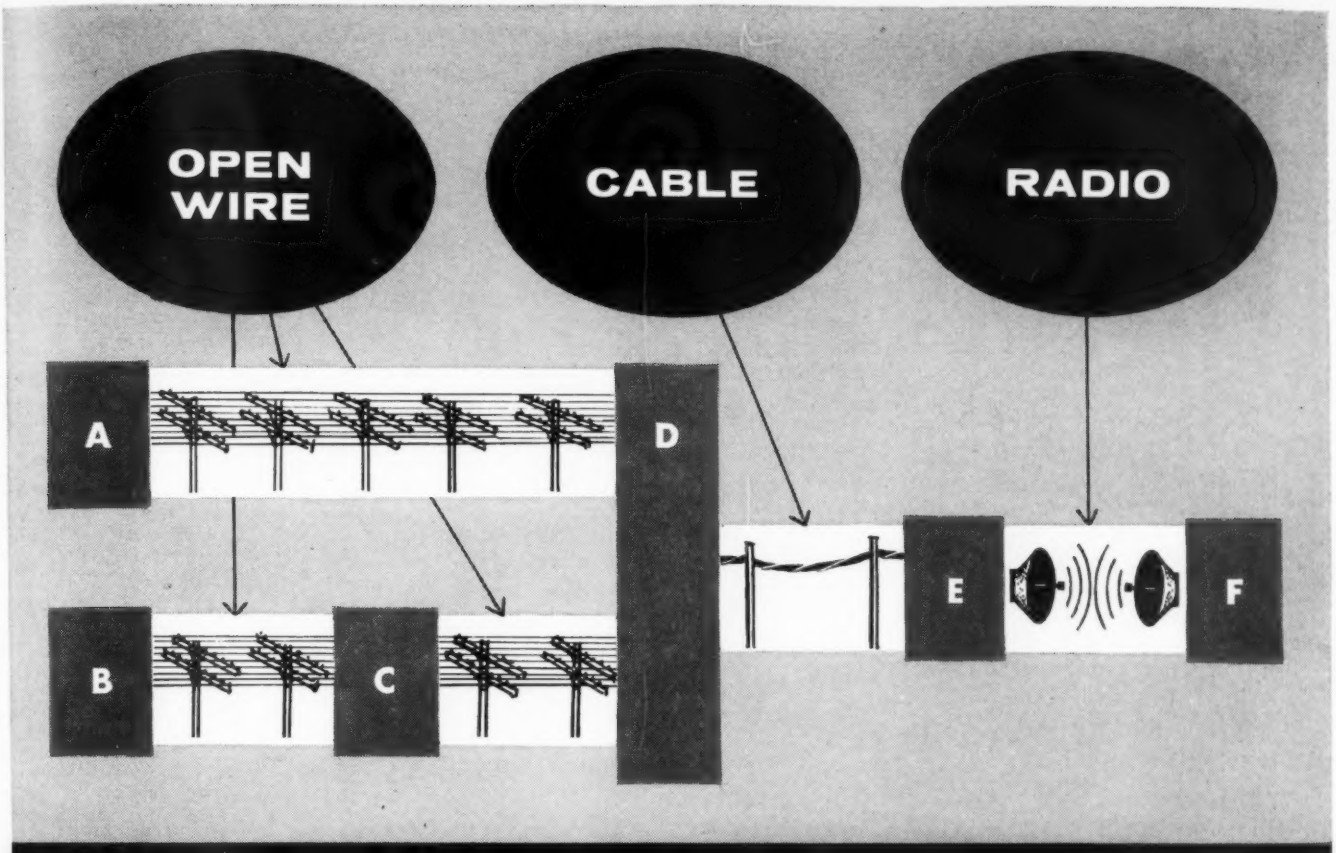

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Type 45BX terminal
Radio terminal

Direct interconnection is the basis of Lenkurt's famous 45 "universal" class of carrier systems. Each of these carrier systems —open-wire, cable and radio—is designed to connect directly with the others *at carrier frequencies*. Thus, your entire carrier network can be completely coordinated. Think of the savings and improved performance this means to you! Expensive back-to-back equipment arrangements to convert carrier to voice frequencies, and then back to carrier, are no longer needed. Maintenance is simpler. Distortion is reduced. Here is a new approach to planning and engineering your toll routes.

The systems of the 45 class offer other important savings, too. *Miniaturized* components permit a maximum number of channels in minimum space. *Plug-in construction* means more flexibility in applications and fewer parts to stock. And you save on installation labor because Lenkurt 45-class carrier comes factory-assembled, rack-mounted and tested as a system.

For complete information on any of the Lenkurt 45-type systems, *write:* Automatic Electric Sales Corporation, 1033 West Van Buren Street (HAymarket 1-4300), Chicago 7.
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